National Pollutant Discharge Elimination System

MUNICIPAL SEPARATE STORM SEWER SYSTEM
DISCHARGE PERMIT NUMBER: MD0068365
STATE DISCHARGE NUMBER: 11-DP-3322

CHARLES COUNTY, MD
ANNUAL REPORT
JULY 2018 - JUNE 2019

Prepared for:

Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard
Baltimore, MD 21230

Submitted by:
Charles County Government
Department of Planning & Growth Management
200 Baltimore Street
La Plata, MD 20646

TABLE OF CONTENTS

FIGURES

TABLES

APPENDIXES

DIGITAL DATA (ATTACHED DVD)

Geodatabase – CharlesCounty_201_MDE_NPDES_MS4.mdb

Feature Classes

Quarterly Grading		
Permit	Rest BMP	Outfall Drainage Area
Alternate BMP Point	BMP POI	BMP Drainage Area
Outfall	Monitoring Site	Monitoring Drainage Area
Municipal Facilities	Alternate BMP Line	Alternate BMP Polygon

Tables

Charles County NPDES MS4 Annual Report and Appendixes (Adobe Portable Document Format and Excel Format)

This page is intentionally left blank.

Executive Summary

This report summarizes activities and progress completed by several County departments to meet the permit conditions found in County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit issued to the County on December 26, 2014. The report covers a 12-month period from July 1, 2018 through June 30, 2019, which is Fiscal Year (FY) 2019. Significant accomplishments have been made in Planning, Operational, Capital Improvement and Fiscal Programs during this permit term and are highlighted below.

Planning Programs

- The County completed the conversion of aerial photography to impervious surface and determined eras of stormwater management provided throughout the County to establish the restoration goal. ***Charles County's Impervious Surface Area Assessment Report*** was submitted to MDE in December 2015. The restoration goal was tentatively approved by MDE in May 2017 and then given final approval September 26, 2018.

- The ***Charles County Municipal Stormwater Restoration Plan – Plan to Achieve Stormwater Waste Load Allocations and Impervious Surface Restoration*** was prepared, presented to the public for comment, and submitted to MDE in June 2016, per a six-month extension ordered by the Circuit Court of Charles County on September 29, 2015. The Plan addresses all approved TMDLs, which at the time included: Mattawoman for nutrients, Patuxent for fecal coliform, and Chesapeake Bay for nutrients and sediment. The rate of implementation was projected at 20% impervious surface restoration per five years and included proposed restoration projects. The plan was revised and resubmitted based on MDE's comments in December 2017 and approved by MDE on November 28, 2018.

- **Watershed Assessments,** which identify and evaluate potential restoration projects, have been completed and presented at public meetings for all 10 of the County's 8-digit DNR Watersheds. The first three assessments were submitted to MDE in June 2016 and the final seven were submitted in June 2018.

- Due to the restoration need and opportunity that exists on the County's extensive privately-owned shoreline, a method of prioritizing sites for funding became necessary. In Fall 2017 an agreement was executed with the Southern Maryland Resource and Conservation Development (RC&D) to conduct a countywide shoreline assessment and prepare a **Shoreline Management Plan for Reaching NPDES MS4 Goals.** The assessment and plan were completed in September 2018 and includes an evaluation of the County's entire 187 miles of tidal shoreline and prioritization of 27 miles containing 153 sites for restoration. The plan establishes a basis for pursuing high priority projects.

- Completed a study of **Continuous Monitoring and Adaptive Control (CMAC)** retrofits for technical and physical feasibility in April 2019.

Operational Programs

- **Street Sweeping and Inlet Cleaning Programs** were established in 2014. These are alternative urban best management practices for achieving the 20% restoration. Together these practices remove an average of 400 tons of debris per year and achieve an average of 160 acres of impervious surface credit. The County has maximized implementation of these low-cost practices. Average costs are $1,721/acre and $20,630/acre, respectively.

- Because septic pumping is an alternative urban best management practice for achieving 20% restoration, a **Septic Pump-out Reimbursement Program** was established in July 2015. Annually, the County receives an average of 735 septic system pump-out applications, generating 22 acres of impervious surface credit at a total five-year cost of $16,896 per acre. In FY 2019 this program was enhanced by adding reimbursement for riser installation on existing homes, which helps ease maintenance costs in the future and minimize barriers. The County has maximized implementation of this low-cost practice.

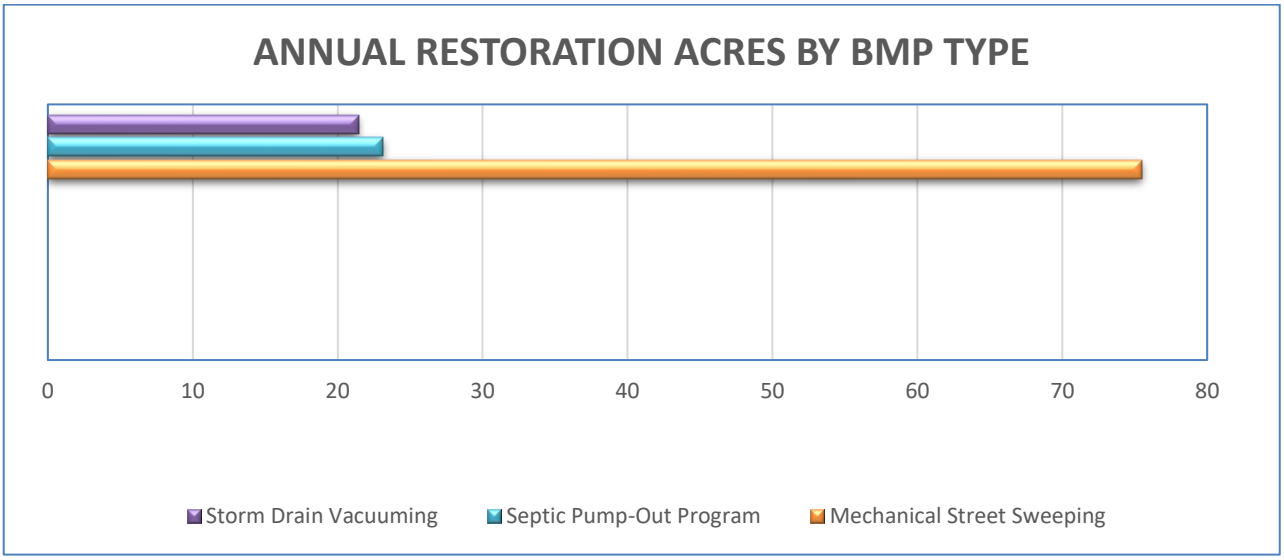
- **Rain Barrel Workshops** began in May 2015, as a collaboration between Charles County Government and University of Maryland Extension staff. These workshops are held twice a year in spring and fall, providing rain barrels at a reduced rate with training on assembly and operation provided by the University of Maryland Extension staff. Each year an average of 110 people participate and 89 rain barrels are distributed.

- A **Watershed Restoration and Outreach Grant Program** was established in partnership with the Chesapeake Bay Trust for the purpose of increasing local non-profit capacity to accomplish watershed restoration projects. Since the program establishment in June 2015, the County has funded $200,000 towards this program to implement seven proposals.

- **Litter reduction** has been significant during the permit term, totaling over 1,000 tons. In 2014, the County provided recycling bins with lids to prevent wind-blown litter and has a steady recycling rate of 50% per year of all municipal waste. By June 2020, curbside collection of recycling will be provided to 47,700 or about 90% of households in the County. The County operates **three litter crews and in 2018 contracted a fourth litter crew.**

- Watershed Protection and Restoration **education and outreach** has increased significantly over the permit term, however impervious restoration credit quantification for these efforts has not been determined. Topics of outreach include scooping pet waste, proper lawn care, illicit discharge and dumping in storm drains.

- Maintenance of stormwater best management practices and preventing illicit discharges are critical to preserving gains in water quality. During the permit term **two new full-time stormwater maintenance inspectors** have been hired to increase compliance and preserve ongoing benefits of existing stormwater best management practices.



Capital Programs

- The County **increased staffing** of restoration project managers from two to four **and hired three consultant firms** dedicated to designing and permitting restoration projects from 2014-present.

- The County also employs **two full-time right-of-way agents** who dedicate 75% of their time to securing the legal rights and access necessary for designing and constructing the watershed restoration projects. Some of the most eroded streams are located in urbanized communities containing numerous small lots. An example stream restoration project requires legal access on over 24 properties.

- Watershed restoration project **easement and maintenance agreement templates** have been developed to streamline the process and ensure the long-term investment is securely maintained.

- Three step pool storm conveyances, four submerged gravel wetlands, five wet ponds, 24 swales, a bioretention, and a large underground storm filtering facility, all located in urban areas, have been completed through 2018. Cumulatively, these **completed projects provide stormwater treatment for 251.71 acres of impervious surface,** at an average cost of $55,771 per acre.

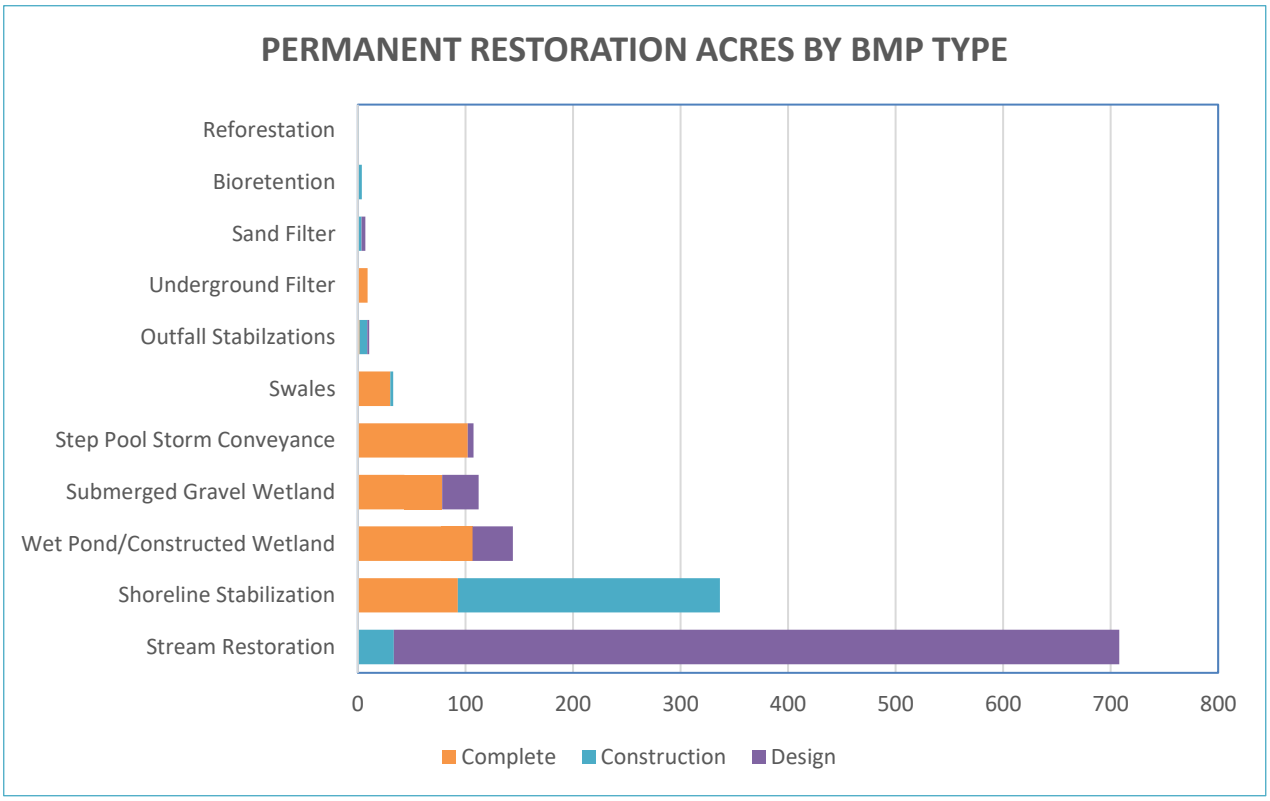
- Acton Hamilton submerged gravel wetland and wetland restoration, General Smallwood Middle School bioretention, Bensville Park swales, outfall stabilizations, sand filter and reforestation, and La Plata High School wet pond are either recently completed or under construction and will treat 81.01 acres of impervious surface runoff, at an average cost of $61,178 per acre.

- The County's **first two living shoreline projects have been completed** at Swan Point and Benedict in the lower Potomac River watershed and lower Patuxent River watershed, respectively. These projects restore 2,321 linear feet, equating to 92.84 acres, at an average cost of $27,280 per acre.

- Potomac Heights and Cliffton Phases I and 2 **living shoreline projects located on the lower Potomac River are under construction** to stabilize 6,097.5 linear feet of shoreline.

- The County's first **three stream restorations are under construction** comprising 2,780 linear feet located in the Mattawoman, Zekiah and Lower Potomac watersheds.

- The County is pursing **multiple septic connection projects** to address nitrogen and bacteria leaching from pre-1990 septic systems, built without 4' of separation from the water table have been approved by MDE as a source that needs to be addressed in order to achieve local TMDLs.



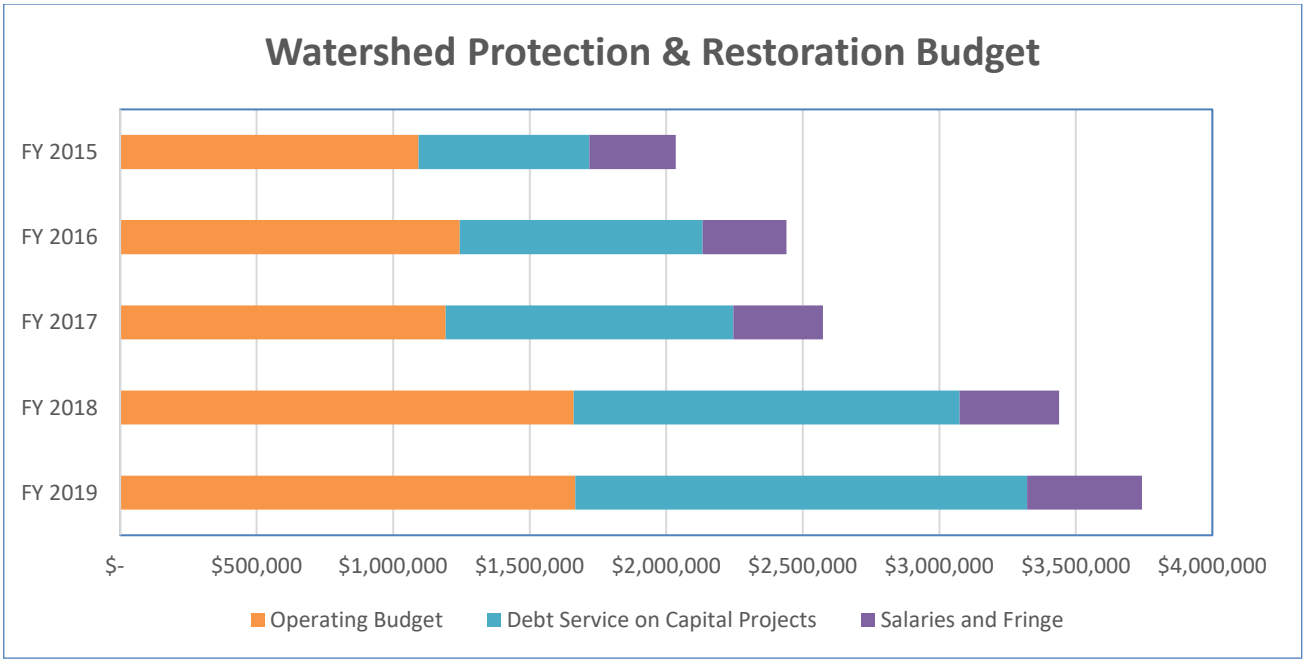
Financial Programs

- Charles County adopted a stormwater remediation fee, dedicated to the Watershed Protection and Restoration Fund in FY 2014. This **Fee has almost doubled in five years**, going from $43 in FY 2015 to $78 in FY 2020. However, beginning in FY 2016 the fund is **subsidized from the General Fund** to minimize fee increases.

- Watershed Protection and Restoration Program **staffing has tripled from 3.5 to 10.4 full time employees in five years.**

- Debt service to support the **$115 million Capital restoration program** is currently $1.94 million annually. Debt is amortized over thirty years to correspond to the life expectancy of the improvements.

- **Financial Assurance Plans** (FAPs) were submitted in Fiscal Years 2016 and 2018. The FAP previously approved on June 5, 2018 was updated by the Charles County Commissioners on October 29, 2019 via Resolution 2019-15. The updated FAP includes a line item for Nutrient Trading, which became effective in the Code of Maryland Regulations on July 16, 2018. Subsequently, the County's MS4 permit was modified on November 8, 2019 to allow nutrient trading.



Response to MDE Comments

On May 3, 2019 the Maryland Department of Environment (MDE) provided comments on Charles County's FY 2018 NPDES MS4 Annual Report and included a request for status update by July 1, 2019 that shows how the 20% impervious area restoration requirement can be met. The County's Impervious Restoration Strategy was submitted on June 28, 2019. Highlights of this strategy are in the Executive Summary and a copy of the strategy is included in Appendix A. Responses to the remaining comments and the June 6, 2019 Financial Assurance Plan comments are provided in the following tables.

Permit Condition	MDE Assessment and Recommendations
Part V.A Annual Progress Reporting	Charles County's 2018 Annual Report was received on Dec 20, 2018. The report described activities during July 1, 2017 to June 30, 2018, i.e., Fiscal Year (FY) 2018. Data were submitted in the MS4 geodatabase format as requested, except as noted below. The County satisfied the reporting requirement of the MS4 permit by submitting this report.
	County agrees.
Part IV.A Permit Administration	The County submitted and organizational chart clearly detailing the administration of MS4 permit requirements, and a current list of County liaisons with contact information.
	County agrees.
Part IV.B Legal Authority	The County maintains adequate legal authority for the implementation of the MS4 permit.
	County agrees.
Part IV.C Source Identification	The County submitted data for urban best management practices (BMPs) built through 2018 or planned for future installation. A total of 4,335 BMPs were listed, including 3,997 active BMPs. The County's narrative indicated that there are currently 2,762 major stormwater BMPs. The County continued to update missing or incorrect data. Below are noted fields that continued to have information missing (details noted in the previous year's review): *BMP* table: • BMP_DRAIN_ID • BMPPOI_ID

Part IV.C Source Identification (continued)	• BMP_DRAIN_AREA *BMPInspections* table: • BMP_ID • BMP_STATUS *BMPPOI* feature class: • IMP_ACRES • APPR_DATE and BUILT_DATE *BMPDrainageArea* feature class: • BMPPOI_ID *AltBMPPoly* feature class: • EQU_IMP_ACR • TIMES_SWEPT *AltBMPLine* feature class: • BMP_DRAIN_AREA • All INSTALL_DATE • US_DRAIN_AREA • TSS_LOAD, TN_LOAD, and TP_LOAD • VEGETATION_REST *RestBMP* feature class: • PE_REQ • PE_ADR The County maintains a map of monitoring locations and water quality improvement projects and submitted these data in the geodatabase.
	The County agrees and continues to work on completing the missing or incorrect data and has submitted the updated progress on the enclosed MS4 Geodatabase.
Part IV.D.1 Stormwater Management	The County submitted data with the annual report as required, including number of waivers and number of plans submitted for each of the three plan approval phases. The County approved 44 concept design plans, 32 site development plans, 34 final plans, and no redevelopment plan. No waivers or exemptions were issued. During the reporting year, 6,523 stormwater management construction inspections were conducted; no violations were found. 751 initial maintenance inspections, 236 follow-up inspections, and 56 enforcement actions were performed and 12 violations were found.

Part IV.D.1 Stormwater Management (continued)	In FY 2018, the County performed 1,059 inspections, a significant increase from 830 performed in FY 2017. All BMPs were indicated in the geodatabase as a score of "P" (passing) either after an initial inspection or re-inspection. MDE conducted the County's stormwater program triennial review in June 2016. The review found that overall the County is sufficiently implementing environmental site design (ESD) to the maximum extent practicable (MEP).
	County agrees.
Part IV.D.2 Erosion and Sediment Control	The County submitted FY 2018 quarterly grading permit reports in the new MS4 geodatabase format. MDE evaluated the County's erosion and sediment control program in 2017. The main issues identified were lack of stabilization, need for maintenance of erosion and sediment control practices, and inconsistent enforcement. The issues were discussed with County staff during a January 2018 conference call, and updated erosion and sediment control inspection and enforcement procedures were submitted to MDE in March. During a follow-up review by MDE on June 21, violations were observed on seven sites; all issues were enforced and resolved by County staff as of a July re-inspection. Because of these demonstrated improvements, MDE delegated continued enforcement authority through June 30, 2020. The County reported 1,553 active grading permits disturbing 4,322 acres, 6,381 inspections, 33 violations, and 33 stop work orders during this reporting period. Additionally, $14,757 in fines were collected.
	County agrees. Delegation of erosion and sediment control enforcement authority was approved on August 16, 2018 and extends through June 30, 2020.
Part IV.D.3 Illicit Discharge Detection and Elimination (IDDE)	The County screened 103 outfalls, including outfalls receiving drainage from industrial (16), commercial (20), and residential (67) land uses. The County conducted chemical tests of dry weather discharges in accordance with permit requirements. Dry weather flows were observed at 44 outfalls, 14 of which were too low to sample. One illicit discharge was detected. Chlorine concentrations were above the threshold limit on the first and second tests at outfall 83, which receives drainage from a residential area. The Department of Public Works discovered

	and repaired a water line leak. The outfall with be re-inspected in FY 2019 to confirm the discharge has been eliminated. The County has met the permit requirements for conducting visual surveys of commercial and industrial areas by screening portions of the development district along US 301 near Bel Alton and Newburg, Cobb Island, Indian Head, Pomonkey, Bryantown, and Benedict. The County reported that approximately 75 tax parcels were visually assessed and provided a map of areas surveyed using a Routine Watershed Inspection Field Sheet. MDE requested that the County submit the Routine Watershed Inspection Field Sheet that is used to conduct visual surveys; the form was received separately from the annual report. MDE plans to conduct a detailed review of the County's standard operating procedures in an IDDE field audit, and will coordinate with County staff to determine the time of that inspection. The County provided maps identifying the commercial and industrial areas surveyed and the outfalls screened during FY 2018. In accordance with the permit, the county maintained a program to address and respond to illegal discharges, dumping, and spills. The County maintains an online reporting form and phone number for water quality complaints. In the FY 2018, four complaints were reported that included leaking vehicle oil and car washing activity. All complaints were resolved. The County has met permit requirements regarding the use of appropriate enforcement procedures. The County provided a list of corrective actions taken, including notices of violation and follow-up inspections. The County has met the IDDE annual reporting requirements.
	County agrees.
Part IV.D.4 Litter and Floatables	Volunteers participated in 101 cleanup events on 83 roads through the Adopt-A-Road program, and the Potomac River Watershed Cleanup removed 11 tons of litter with 830 volunteers. The Department of Public Works coordinated 18 Community Cleanups. County crews removed an additional 190 tons of trash. The County estimated a 50% recycling diversion rate in Calendar Year 2017. Expanded public education on litter and recycling included two outreach

Part IV.D.4 Litter and Floatables (continued)	events and the County Fair, newspaper ads and news releases, four brochures, 13 school visits, and 60,000 tax bill handouts. The County increased the budget for litter control crews and public education, added days for household hazardous waste collection, and was considering adding volunteer opportunities. MDE commends the County for these efforts.
	County agrees.
Part IV.D.5 Property Management and Maintenance	384 staff were trained across six dates on pollution prevention topics; training dates, locations, and topics were described. During the reporting period, 2,775 tons of salt were applied during eight storm events. The County continued to provide training annually and as needed, calibrate equipment before and after use, and increase efficiency of material use through timed application. The County maintained stormwater pollution prevention plans (SWPPPs) and conducted periodic inspections as required for the three County-owned facilities requiring 12-SW coverage. A summary was provided. The County swept 167 tons of debris from 430 miles of road, vacuumed 30 tons of debris from 88 pipes and 82 inlets, and repaired 24 inlets. The use of herbicides continued to increase (from 3,000 to 3,700 gallons of glyphosate) due to road resurfacing.
	County agrees.
Part IV.D.6 Public Education	The County maintained several educational web pages and online social media, receiving and increase in visits from the previous year. Public education events included storm drain stenciling, rain barrel and compost bin workshops (82 barrels and 76 bins distributed), the annual County Fair, and educating 200 students during two career days. The County continued to air Public Service Announcements on television, radio, and online. The County developed and posted online stormwater BMP maintenance documents in English and Spanish for citizens and professionals.

Part IV.D.6 Public Education (continued)	In partnership with the Chesapeake Bay Trust, the County continued to award grant money for stormwater projects in public spaces. The public hotline and online reporting system continued to be maintained for citizens to report suspected illicit discharges and spills.
	County agrees.
Part IV.E Restoration Plans and TMDLs	<u>Watershed Assessments:</u> Per annual report requirements, the County reported a summary of progress made as of June 30, 2018. All assessments have been completed, made available to the public for comment, and submitted to MDE. The County has hereby satisfied the requirements of Parts IV.E.1 and IV.E.3 of the permit. • Completed in previous reporting years: Port Tobacco, Mattawoman Creek, Lower Patuxent River • Completed during this reporting year: Gilbert Swamp, Zekiah Swamp, Wicomico River, Upper Potomac River Tidal, Middle Potomac River Tidal, Lower Potomac River Tidal, Nanjemoy Creek The County provided a summary of potential stormwater management project types and costs within each watershed for which an assessment was completed during the current reporting year. <u>Impervious Area Restoration:</u> • The total impervious area baseline is 7,887 acres, of which 1,577 acres (20%) is required by the end of the permit term. The County should update future annual reports to reflect these adjustments. • The county reported that 263 acres of impervious surface was restored in FY 2018, including 87 acres completed from construction and 130 acres treated by annual BMPs. The County reported that a total 673 acres have been restored during the permit term (approximately 8.5% of the baseline) and projected an additional 222 acres of completed restoration by the end of the permit term (total 895 acres, 11.3%). • The County must create and implement a strategy to complete the restoration requirement by the end of the permit term, December 26, 2019. This strategy must be submitted to MDE by July 1, 2019. • The County determined that acquiring nutrient credits would no longer be a feasible strategy to restore the remaining balance of impervious area restoration requirement specified in the permit (i.e., 20% of the

Part IV.E Restoration Plans and TMDLs (continued)	County's impervious area baseline). To verify that the County remains on schedule, the County must submit a status update by July 1, 2019. MDE encourages the County to reach out earlier if there are any concerns or need for technical assistance. • As noted in the previous annual report review, all BMPs in the RestBMP table with a Project Description of "ISA Baseline Reduction" must be moved to the BMP table, and REST_BMP_ID "CH16RST000048", currently listed in as "Pond Reclassification", should be changed to "ISA Baseline Reduction" and moved the BMP table. <u>Total Maximum Daily Load (TMDL) Restoration Plans:</u> The County submitted with the annual report updated restoration plans for the TMDLs listed below. Additional comments by MDE's Integrated Water Planning Program (IWPP, formerly Science Services Administration) are forthcoming in a separate document. MDE's Water and Science Administration (WSA, formerly Water Management Administration) has the following comments: • Total Nitrogen (TN), Total Phosphorus (TP), and Total Suspended Solids (TSS) TMDLs in the Chesapeake Bay: ○ The target load reductions are 20.24% TN and 38.26% TP. As of FY 2018, 9.2% TN and 16.8% TP reductions have been achieved. ○ In FY 2018, the County TMDL loads increased slightly from the previous year: TN (174,007.12 to 174,250.91), TP (16,798.59 to 16,863.35), TSS (4,872,194.77 to 5,122,337.15). Full comments on TMDL load reduction achievements will be provided at a later date by MDE IWPP. • TN and TP TMDLs in the Mattawoman Creek (02140111): • As of FY 2018, the County has achieved 7.6% of the TN and 8.6% of the TP load reductions (4,265 pounds/year TN reduced and 425 pounds/year TP reduced). From FY 2019-2023, the County planned a total 11% reduction in TN load and 22% reduction in TP. Beyond those reductions, the County would be required to perform an additional 43% TN reduction and 25% TP reduction (24,140 pounds/year TN and 1,230 pounds/year TP) by the target year 2035. ○ Fecal Coliform Bacteria TMDL in the Lower Patuxent River (shellfish harvesting areas) – Indian Creek (021311010887) • As of FY 2018, the County has achieved 3% of the bacteria load reduction (96 pounds/year bacteria reduced). The County plans to achieve the total 52% load reduction (1,579 pounds/year bacteria reduced) by the target year 2025. ○ As the County noted, the TSS TMDL in the Lower Patuxent River (02131101) was approved in 2018 and the PCB TMDL in the

	Mattawoman Creek was being drafted at the time of reporting. The County was developing plans for these TMDLs.
	On May 31, 2019 the County submitted a request to MDE requesting the County's MS4 permit be modified to add nutrient trading as a compliance option. MDE held a public hearing to modify the permit on July 31, 2019 and issued the modified permit no November 8, 2019. On June 28, 2019 the County submitted an Impervious Surface Restoration Action Strategy and draft updated Financial Assurance Plan to MDE showing the use of nutrient credit trading to meet the 20% impervious surface restoration requirement. The strategy can be found in Appendix A. On July 17, 2019 MDE reviewed the strategy and determined it sufficient. In a letter dated April 24, 2019, MDE's Integrated Water Planning Program (IWPP) approved an extension for submittal of the Lower Patuxent River TSS TMDL Implementation/Attainment Plan from July 1, 2019 to December 25, 2019. The extension was granted to allow the County sufficient time for data collection and analysis through the summer and analysis in the fall. The County compiled the data and submitted it to MDE in a technical memorandum dated October 19, 2019. At a meeting on November 12, 2019 MDE and the County agreed to reconvene in the following months to develop the framework of the Implementation/Attainment Plan, thus on November 25, 2019 MDE issued a memo approving to extend the timeline of plan submittal to accommodate this timeframe. IWPP provided a verification e-mail on March 5, 2019 that a TMDL restoration plan for the Mattawoman Creek PCB TMDL would not be required, since the 5% reduction is expected to be achieved from atmospheric deposition (derived from the Tidal Potomac PCB TMDL).
Part IV.F Assessment of Controls	During the reporting year, the County monitored seven storm events and took one baseflow measurement on July 6, 2018. In the event the County is unable to capture eight storm events, a baseflow sample may be substituted; and explanation should also be provided in the narrative that describes the reason(s). The County submitted Assessment of Controls data via the geodatabase. MDE's comments are as follows:

Part IV.F Assessment of Controls (continued)	• ChemicalMonitoring
	  ○ 47 records were submitted dating back to 2015; 15 were from the most recent reporting year, including seven storms sampled at AH001, six sampled at AH002, and one baseflow sampled at each
	  ○ All required fields were filled in
	  ○ The County noted that for several samples, the eight-hour holding time for *E. Coli* had been exceeded
	• MonitoringSite
	  ○ 25 records submitted
	  ○ All required fields were completed
	• MonitoringDrainageArea
	  ○ 25 records submitted
	  ○ All required fields were completed
	• BiologicalMonitoring
	  ○ 14 records submitted, dating back to 2006
	  ○ All required fields were completed
	  ○ The Benthic Index of Biotic Integrity (BIBI) scores ranged from 1.9 to 4.1 over this 13-year period, with 2018 being the highest (and up from 2.7 in 2017)
	The County continued physical monitoring at the Acton-Hamilton site, a tributary to Mattawoman Creek. Results were discussed. The area on cross-section 1 increased during the monitoring period, and cross-section 2 was experiencing continued downcutting and erosion near the bank bottom.
	
	The County continued the Piney Branch watershed Stormwater Management Assessment. Detailed results were discussed. In the past year there was no new construction and the channel remained relatively stable.

	County agrees.
Part IV.G Program Funding	The Stormwater Remediation Fee increased again in 2019 from $54 to $61, along with other funding sources, and the total revenues increased from $3.7M for FY 2019. For that year, expenditures ($3.8M) slightly exceeded revenues; but the permit fund balance estimate remain positive ($783,500). The County's total permit budget increased to $3,559,400 in FY 2019. The Count increased the FY 2019 budget to $300,000 for maintenance of stormwater management BMPs. Additionally, the budget for public education and outreach was increased, and the County increased appropriations for the Capital Improvement Program. MDE commends the County for its commitment to ensuring BMPs are regularly maintained.

Part IV.G Program Funding (continued)	In accordance with Maryland State law, the County submitted a Financial Assurance Plan (FAP) and Watershed Protection and Restoration Program (WPRP) Annual Report on December 20, 2018. The FY 2017 WPRP Annual Report was also submitted with the annual report. A complete review of the Financial Assurance Plan will be provided to the County in separate correspondence.
	County agrees, with the exception that the text should be revised to reflect the FY 2018 WPRP Annual Report was submitted with the annual report.

On June 6, 2019 MDE acknowledged receipt of the Charles County FAP and provided the following comments to be addressed in subsequent FAPs and submitted with the FY 2018 NPDES MS4 Annual Report. Following are the County's responses.

FAP Condition	MDE Assessment and Recommendations
Demonstration of Sufficient Funding	Annotated Code of Maryland ENV § 4-202.1(j) requires Phase I Municipal Separate Storm Sewer System (MS4) jurisdictions to submit the Financial Assurance Plan (FAP) every 2 years on the anniversary of the date of date of issuance of its permit. Charles County submitted the FAP to the Maryland Department of the Environment (MDE) on December 20, 2018. A public hearing was held on June 7, 2016. County Commissioners voted to approve the FAP in Resolution No. 2016-18 on June 28, 2016. A copy of the resolution was submitted with the FAP. The "ISRP Revenue" table showed that in FY 2019 and FY 2020, annual revenue appropriated for restoration efforts would cover the annual cost for the remainder of the permit term (which ends on December 25, 2019, or halfway through FY 2020). However, the County's impervious surface restoration plan (ISRP) rate of implementation does not meet its MS4 permit's 20% restoration requirement. Meeting the 20% restoration requirement in the five-year permit term is crucial in the analysis of the County's FAP. Because restoration implementation data are missing, the Department requires that the County Submit an updated FAP by June 30, 2019 that demonstrates sufficient ISRP implementation and funding.

	County agrees, with the exception that the FAP public hearing was held on June 5, 2018 and the County Commissioners voted to approve the FAP in Resolution 2018-08 on June 5, 2018. The County submitted a draft updated FAP to MDE on June 28, 2019 that demonstrates sufficient ISRP implementation and funding. A public hearing on the updated FAP was held on October 8, 2019 and the County Commissioners voted to approve the FAP in Resolution 2019-15 on October 29, 2019.
Actions to Meet Permit Requirements ("All Actions" worksheet)	The County projected to complete a total 892 acres (12.1%) of restoration by the end of the permit term, short of the 1,577 acres required (20%). The County noted in the Executive Summary that while the first FAP proposed a temporary nutrient trade with the Mattawoman Waste Water Treatment Plant, that option is no longer being considered as part of the restoration plan because the plant is unable to generate credits, and that "other trading options may be explored". Nutrient credit trading was not specifically included in the FY 2018 FAP tables as a planned activity to meet the restoration requirement. In the MS4 Information table, the Baseline Treatment Requirement (Acres) was listed as 7,402 acres. It has since been updated to 7,887 acres. This slightly reduces the acres restored to date and the acres expected to be restored using the information submitted in the FAP. As noted in the "Spec Actions" table, the County has completed 9.1% of the restoration requirement (673 acres); using the updated baseline, the portion is 8.6%. The County's expected 892 acres of restoration is listed as 12.1% of the requirement; using the updated baseline, the portion is approximately 11.3%. All best management practices (BMPs) listed are approved in MDE's Guidance or by the Chesapeake Bay Program (CBP) and were realistic to perform in the time allotted. In the "All Actions" and "Spec Actions" tables, the implementation cost was indicated as $0 for septic denitrification, septic connections, rain barrel installation and private shoreline stabilization. The Watershed Protection and Restoration Program tables submitted with the County's 2018 stormwater program annual report indicated that septic denitrification activity in FY 2018 was funded through a grant provided by the Maryland Department of Health (MDH). Future FAPs should indicate in the "All Actions" and "Fund Sources" tables if funding for this activity will come from

	the grant provided by MDH. Additionally, the county should indicate the source of funding for any other activity or specify that the activity has no cost, e.g., volunteer activity. Within the table, all formulas and subtotals were used correctly and all required fields were populated. All BMP types were correctly entered, including annual operational BMPs. The plan included and Executive Summary and all required information in the MDE suggested table format. The County documented both planned BMPs and BMPs under construction for the projected FYs 2021-2023, beyond the permit term.
	County agrees and will make changes in the next FAP.
Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)	The "ISRP Cost" table indicated that the budget for street sweeping is approximately $110,000 annually, but the "All Actions" table estimated the cost at $50,000 annually. In the next FAP, the County should correct these numbers or provide an explanation. The average cost per acre for completed restoration efforts was approximately $30,750. The County planned to install a diverse mixture of BMP types through the end of the permit term. In the "ISRP Cost" table, costs were reported for all required fiscal years and all formulas were used correctly.
	County agrees and will make changes in the next FAP.
Annual and Projected Revenues ("ISRP Revenue" worksheet)	Revenues were reported for all required fiscal years and all formulas were used correctly. For the next two fiscal years, the projected annual revenue exceeds the cost (109%) and exceeds the percent of funds directed toward annual restoration activities.
	County agrees.

Funding Sources ("Fund Sources" worksheet)	Funds were reported for all required fiscal years and all formulas were used correctly within the worksheet. Sources of funds for the next two years include: ○ Bonds = $22.96M ○ Stormwater Fees, Miscellaneous Fees, and Watershed Protection and Restoration Fund Balance = $6.55M ○ General Fund = $1.1M ○ Erosion and Sediment Control Fees = $0.76M ○ Stormwater Maintenance Fees = $0.70M ○ Total Funding Sources = $32.1M On average for the next two fiscal years, the County projected that the majority of the annual funds for meeting permit requirements would be from general obligation bonds (72%) but a significant portion would be funded by the stormwater utility fee (19%). No grant or loan sources were reported.
	County agrees.
Specific Actions and Expenditures from Previous Fiscal Years ("Spec Actions" worksheet)	The baseline was listed in the table as 7,402 acres. As noted regarding the "MS4 Information table", it has since been updated to 7,887 acres. Therefore, the actual completed restoration is 8.6% (listed as 9.1% in the table). The County reported BMPs completed since the expiration of its previous permit term. Actions and expenditures were reported for all required fiscal years and all formulas were used correctly.
	County agrees.

I. Identification

Permit Number: 11-DP-3322 MD0068365

Permit Area: The permit covers all stormwater discharges from the municipal separate storm sewer system (MS4) owned or operated by Charles County, Maryland.

Effective Dates: December 26, 2014 thru December 25, 2019 (modified November 8, 2019)

FY 2019 Status

Charles County, Maryland has been operating its municipal separate storm sewer system (MS4) under a National Pollutant Discharge Elimination System (NPDES) MS4 permit since 1997, when the first five year permit was issued by the Maryland Department of Environment, Water Management Administration (MDE/WMA). On July 31, 2002, the County was issued a second, five-year permit. Each permit issuance or renewal is referred to as a generation, for example, first generation, second generation, and so on. The County's first and second generation permits covered stormwater discharges from the MS4 within the Development District, which is the County's urban area.

NPDES MS4 permits are typically issued on a five year cycle however, if re-issuance is delayed, the existing permit is considered administratively extended until a new permit is issued.

A third generation, five-year MS4 permit was issued on December 26, 2014, and expanded permit coverage to the entire county. This permit also initiated permit conditions which significantly increased the cost of permit implementation. These conditions include expanding the Geographical Information System (GIS) data countywide, restoring 20% of the County's untreated impervious surface area countywide, and preparing watershed restoration plans to address total maximum daily loads (TMDLs) for both local waterways and the Chesapeake Bay.

The third generation permit was modified on November 8, 2019 to add Part IV.E.3 titled, "Nutrient Trading." This new section allows the County to acquire total nitrogen, total phosphorus and total suspended solids credits in accordance with the requirements of the Maryland Water Quality Trading and Offset Program for purposes of meeting the 20 percent impervious surface area restoration requirement of the permit.

As part of this comprehensive water quality control permit, the County is required to report to the Maryland Department of the Environment, Water Management Administration (MDE/WMA) annually regarding the status and progress of the permit conditions. The annual reports are based on State/County fiscal year and are due on the anniversary date of the permit.

This report summarizes the actions taken by the County to fulfill the requirements of the NPDES permit. Following each permit condition is a description of the work completed during the reporting year.

II. Definitions

Terms used in this permit are defined in relevant chapter of the Code of federal Regulations (CFR) or the Code of Maryland Regulations (COMAR). Terms not defined in CFR or COMAR shall have the meanings attributed by common use unless the context in which they are used clearly requires a different meaning.

III. Water Quality

The permittee must manage, implement, and enforce a stormwater management program in accordance with the Clean Water Act (CWA) and corresponding National Pollutant Discharge Elimination System (NPDES) regulations, 40 CFR Part 122.

Compliance with conditions in Parts IV through VII of the permit shall constitute compliance with Subsection 402(p)(3)(B)(iii) of the CWA and adequate progress toward compliance with Maryland's receiving water quality standards and U.S. Environmental Protection Agency (EPA) approved stormwater waste load allocations (WLAs) for this permit term.

IV.A. Permit Administration

Overview of Permit Conditions

1. *Charles County shall designate an individual to act as liason with MDE for implementation of this permit. The County shall provide the coordinator's name, title, address, phone number, and e-mail address. Additionally, the County shall submit in its annual reports to MDE, including an organizational chart detailing personnel and group responsible for major NPDES program tasks in this permit. MDE shall be notified of any changes in personnel or organization relative to NPDES tasks.*

FY 2019 Status

Listed below are the County's liasons to MDE for permit implementation.

Liasons' updated address:

Charles County Planning Division
200 Baltimore Street,
La Plata, MD 20646

Liasons' Phone and E-mail Contact Information:

Jason Groth, Planning Director
301-396-5814 (P), GrothJ@charlescountymd.gov

Charles Rice, Program Manager
301-645-0651 (P), RiceC@charlescountymd.gov

Karen Wiggen, Planner
301-645-0683 (P), WiggenK@charlescountymd.gov

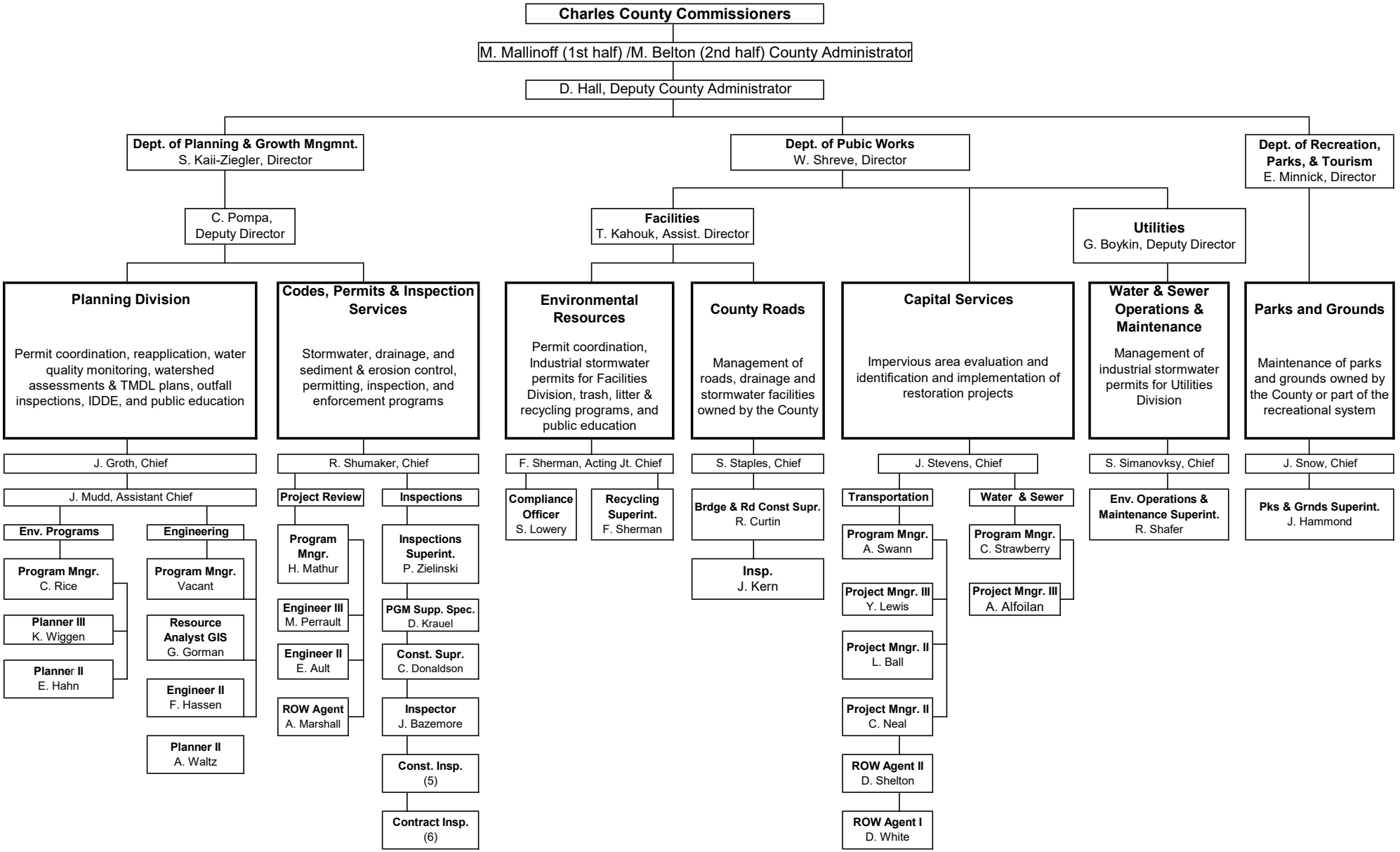
Organizational Chart:

The NPDES program tasks in this permit are divided between three departments in Charles County: Planning and Growth Management (PGM), Public Works (DPW) and Recreation, Parks and Tourism (RPT). These departments coordinate with other departments, such as the County's Attorney's Office and the Department of Fiscal and Administrative Services, as necessary to implement the permit.

PGM's responsibilities primarily include the stormwater and erosion and sediment control permitting programs, development of geographic information system (GIS), monitoring water quality, managing the illicit discharge elimination and detection program, managing the septic pump-out program, and public outreach. DPW's responsibilities primarily include implementing the capital restoration projects, maintenance of County owned right-of-ways, maintenance of the public drainage system, implementation of stormwater pollution prevention plans for County owned industrial properties, the litter and floatables program, and public outreach. RPT's responsibilities include maintenance of County owned parks and other properties.

A reorganization within PGM took place in January 2018, which incorporated Resource Infrastructure Management (RIM) with the Planning Division and retitled as the Engineering Section. The new Engineering Section is shown on the following organizational chart. A reorganization within DPW took place in July 2018, which moved Capital Services from management under Public Facilities to management under Utilities. By mid-year or about January 2019 Capital Services was no longer under Utilities. The new structure is shown on the following organizational chart detailing personnel and divisions responsible for major NPDES program tasks in this permit.

FY 2019 NPDES MS4 Organizational Chart



IV.B. Legal Authority

Overview of Permit Conditions

Charles County shall maintain adequate legal authority, in accordance with NPDES regulations 40 CFR 122.26(d)(2)(I), throughout the term of this permit. In the event that any provision of its legal authority is found to be invalid, the County shall make the necessary changes to maintain adequate legal authority.

FY 2019 Status

The County will maintain adequate legal authority throughout the term of this permit, and in the event that any provision of its legal authority is found to be invalid, the County will make the necessary changes to maintain adequate legal authority.

IV.C. Source Identification

Overview of Permit Conditions

Sources of pollutants in stormwater runoff shall be identified and linked to specific water quality impacts on a watershed basis. Annual reporting of these data has been provided within the County's Development District for the previous permit. Because identification of water quality impacts in impaired watersheds outside of the Development District is necessary, this reporting is expanded to the entire permit area to support ongoing efforts in watershed restoration plans. This information shall be compiled and updated annually. By the end of the permit, the County shall provide the following data for all watersheds within the permit area in geographic information system (GIS) format with associated tables as required in Part V. of this permit:

1. *Storm drain system: infrastructure, major outfalls, inlets, and associated drainage areas;*
2. *Industrial and commercial sources: industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants;*
3. *Urban best management practices (BMPs): stormwater management facility data including outfall locations and delineated drainage areas;*
4. *Impervious surfaces: public and private land use delineated, controlled and uncontrolled impervious areas based on, at minimum, Maryland's hierarchical eight-digit sub-basins;*
5. *Monitoring locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the 2000 Maryland Stormwater Design Manual; and*
6. *Water quality improvement projects: projects proposed, under construction, and completed with associated drainage areas delineated.*

FY 2019 Status

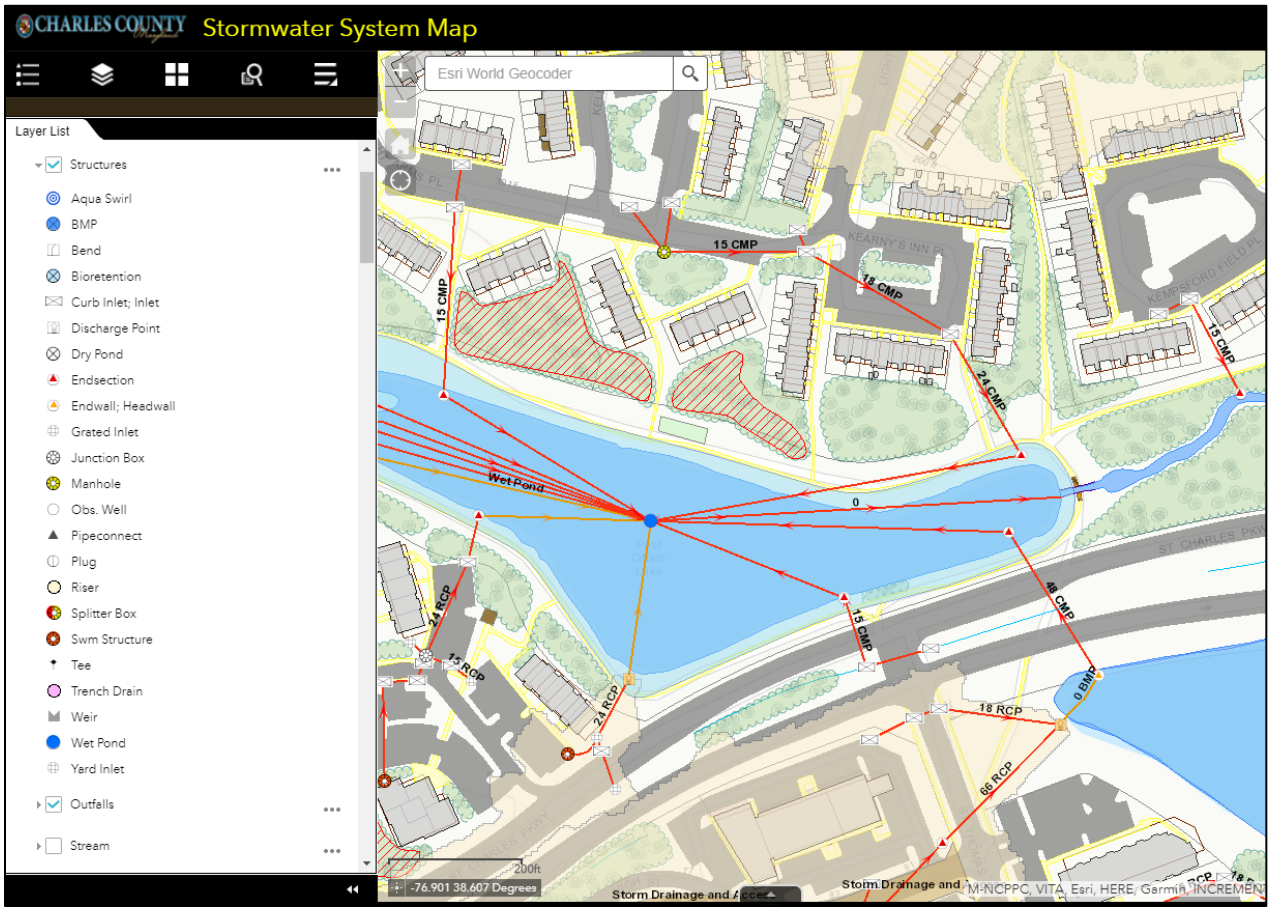
In anticipation of MDE expanding the County's NPDES MS4 Permit countywide, Charles County began compiling the above listed GIS data for areas outside of the Development District in FY 2012. The expanded GIS data coverage has proven to be a significant resource to the County for public storm drain and stormwater best management practice (bmp) maintenance, stormwater permitting reviews, environmental permitting reviews, stormwater facility maintenance inspections, and watershed restoration planning.

In an effort to provide the stormwater data on a platform that would be easily accessible by County maintenance providers, permit reviewers and inspectors in the office or in the field, a stormwater web application has been established. As of FY 2016, the County hosts the web application.

Stormwater Data and Tools

Staff continues to become more adept at using the internal Stormwater System Map website and training is provided annually. Capabilities include:

- trace tool used to trace flow in a drainage system upstream for identifying potential sources of illicit discharges;
- project locator tool used to locate bmps by permit number;
- street locator tool to locate bmps by address;
- links to stormwater management, drainage and forest conservation easement documents, used to view easements of record;
- micro-bmp tool used to view approved permit plans for micro-bmps;
- inspection tool used to identify status of stormwater bmp inspections;
- 2007, 2011 and 2014 aerial imagery for comparison, 2017 imagery added in FY 2018;
- link from the project site to the construction/as-built drawings for the project (added in FY 2017); and
- major outfall search tool and photos (added in FY 2017).



MDE's NPDES MS4 Geodatabase Design and User's Guide

Early in 2015, MDE released the *NPDES MS4 Geodatabase Design and User's Guide Versions 1.0* and *1.1*. County staff and consultants attended MDE's meetings on April 8, 2016, July 8, 2016, and August 10, 2016 with MS4 jurisdictions to discuss and clarify the many submitted questions on the geodatabase. To address issues raised during the meetings, MDE issued a question and answer spreadsheet. Revisions are reflected in Version 1.2, released in May 2017.

County staff has been working with consultants to convert existing data into the new schema, developing sources of previously uncollected data, and establishing replica databases and data check-out systems for data modifications. These features allow multiple users, including the County and consultants, to continually modify the data, while having the latest information.

MDE's MS4 Geodatabase format includes the following (12) feature classes and (24) tables:

- **Permit Administration:** *Permit Information table*;
- **Source Identification:** *Outfall feature class; Outfall Drainage Area feature class; BMP Point of Investigation feature class; BMP table; BMP Drainage Area feature class; Impervious Surface table; Monitoring Site feature class; Monitoring Drainage Area feature class; Alternate BMP Line feature class; Stream Restoration Protocols table; Shoreline Management Practices table; Alternate BMP Point feature class; Alternate BMP Polygon feature class; and Restoration BMP feature class*;
- **Management Programs:** *Stormwater Management Program table; BMP Inspections table; Alternate BMP Line Inspections table; Alternate BMP Point Inspections table; Alternate BMP Polygon Inspection table; Restoration BMP Inspection table; Erosion and Sediment Control Program table; Quarterly Grading Permits feature class; Quarterly Grading Permit Information table; Responsible Personnel Certification Information table; Illicit Discharge Detection and Elimination Program table; Municipal Facilities feature class; and Chemical Application table.*
- **Restoration Plans and Total Maximum Daily Loads:** *Countywide Stormwater Watershed Assessment table; and Local Stormwater Watershed Assessment table.*
- **Assessment of Controls:** *Chemical Monitoring table; Local Concern Monitoring table; and Biological Monitoring table.*
- **Program Funding:** *Fiscal Analysis table.*
- **Narrative Files:** *Documents, Charts and Reports table.*

This annual report includes the MS4 Geodatabase prepared according to MDE's *User's Guide Version 1.2*, which is enclosed on CD. The additional required GIS information, not in the MS4 Geodatabase is provided separately on the CD, as noted below. Following are updates:

- **Storm Drain System:** The FY 2019 data includes approximately 37,284 linear features (pipe, culvert, open channel) to total 625 miles, of which 355 miles are asset. The GIS also includes over 41,227 structures. The storm drain system is provided separate from the MS4 Geodatabase with the exception of the outfalls and outfall drainage areas, which are included in the MS4 Geodatabase.

- **Industrial and Commercial Sources:** MDE noted on the question and answer spreadsheet, referenced above that this information is to be captured in the Municipal Facilities feature class of the geodatabase. Charles County has three municipal facilities with industrial stormwater permits, which have been added to the MS4 Geodatabase. A narrative summary of the data is included in Part IV.D.5. of this report.

- **Urban Best Management Practices (BMPs):** The County continued to work through its digital and paper files to expand and improve the County's stormwater GIS coverage countywide. The FY 2019 total is 2,782 major stormwater BMPs. The BMP data also includes inspection information and drainage areas, which is included in the MS4 geodatabase. A narrative summary of the BMP data is included in Part IV.D.1. of this report.

- **Impervious Surfaces:** In 2013, the County first delineated impervious surface polygons based on 2011 aerial photographs. In FY 2015, 11,586 gravel parking areas and dirt roads were added to the polygon data. Also in 2015, the County completed an impervious surface analysis of controlled acres based on era of stormwater management provided. A discussion of this analysis is included in Part IV.E.2.a. of this report. This data has since been revised and provided separately to MDE in August 2016 and May 2017.

- **Monitoring Locations:** A total of 25 stations are now included in the MS4 Geodatabase, some of which are no longer being used, but are maintained for historical purposes. A narrative summary of monitoring data is included in Part IV.F. of this report.

- **Water Quality Improvement Projects:** Stormwater management best management practices that are completed, under construction and proposed, have been added to the Restoration BMP feature class and shown as points according to the *User's Guide*. Additional water quality improvement projects have been included under Alternate BMP lines (streams, shoreline and outfall stabilizations), Alternate BMP points (septic upgrades and rain barrels), and Alternate BMP polygons (street sweeping, inlet cleaning and tree planting) according to the *User's Guide*. A narrative summary of the water quality improvement projects is included in Part IV.E.2.a. of this report.

IV.D. Management Programs

Overview of Permit Conditions

The following management programs shall be implemented in areas served by the County's MS4. These management programs are designed to control stormwater discharges to the maximum extent practicable (MEP) and are to be maintained for the term of the permit. Additionally, these programs are to be integrated with other permit requirements to promote a comprehensive adaptive approach toward solving water quality problems. The County shall modify these programs according to needed program improvements identified as a result of periodic evaluations by MDE.

1. Stormwater Management

An acceptable stormwater program shall continue to be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. County activities shall include following items a-d.

a. Stormwater Management activities to implement the latest version of the 2000 Maryland Stormwater Design Manual include:

i. Complying with the Stormwater Management Act of 2007 (Act) by implementing Environmental Site Design (ESD) to the MEP for new and redevelopment projects;
ii. Tracking the progress toward satisfying the requirements of the Act and identifying and reporting annually the problems and modifications necessary to implement ESD to the MEP; and
iii. Reporting annually the modifications that have or need to be made to all ordinances, regulations, and new development plan review and approval processes to comply with the requirements of the Act.

FY 2019 Status

Per the Maryland Stormwater Management Act of 2007, which requires use of environmental site design to the maximum extent practicable, the County adopted new stormwater regulations on July 13, 2010. These regulations went into effect on August 1, 2010. The Notice on the adoption of the Stormwater Management and Storm Drainage Ordinances, including Procedures on Requesting an Administrative Waiver, was included in the 2011 NPDES MS4 Annual Report. Since that time, no modifications have been made to these Ordinances.

The County continues to implement the stormwater management design policies, principles, methods, and practices found in the 2000 Maryland Stormwater Design Manual and COMAR 26.17.02.

b. Stormwater Management implementation information to be maintained on MDE's database and submitted annually:

i. Number of Concept, Site Development, and Final Plans received. Plans that are re-submitted as a result of revision or in response to comments should not be considered as a separate project:
ii. Number of redevelopment projects received;
iii. Number of stormwater exemptions issued; and
iv. Number and type of waivers received and issued, including those for quantity control, quality control, or both. Multiple requests for waivers may be received for a single project and each should be counted separately whether part of the same project or plan. The total number of waivers requested and granted qualitative and quantitative control shall be documented.

FY 2019 Status

Since the County's adoption of the stormwater management regulations (August 1, 2010) requiring environmental site design (ESD) to the maximum extent practicable (MEP), through FY 2019, a total of 342 projects have submitted Concept SWM Plans, which is Step 1 of the regulation. During that same time period, 266 projects have also submitted Site SWM Plans, which is Step 2 of the regulation.

Table 1: Stormwater Management Concept and Site Plans

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
VSC (Step 1)	35	27	38	33	39	42	45	44	39	342
VSS (Step 2)	16	27	21	25	30	26	35	32	54	266
Total	51	54	59	58	69	68	80	76	93	608

For the FY 2019 time period, the County received 32 new Development Services Permit submissions (these permit submissions may also include the Final Stormwater Management Plans, which is the Step 3 of the regulation).

For FY 2018 time period, the County received 1 redevelopment project under the Concept SWM Plan application; no redevelopment projects were received under a Site SWM Plan application. There were 32 stormwater management plans that had received final approval and the associated development services permits were subsequently issued in FY 2019 (some of these issued permits were plan revisions). A table of FY 2019 issued SWM permits follows.

Table 2: Final Approved Stormwater Management Plan Permits in Fiscal Year 2019

16-0050	14-0057	12-3-088	08-2-227	17-0033	18-0006	18-0002
18-0005	17-0047	17-0075	11-0060	16-0055	VR-18-0001	17-0040
17-0096	18-0004	VI-18-0001	11-0060	18-0010	17-0071	
17-0082	18-0007	18-0003	14-1-050	17-0085	15-0039	
17-0053	17-0084	18-0002	18-0014	17-0079	17-0083	

**Format: First two digits=submittal year, third digit=revision number, last three digits=sequence*

For the FY 2019 time period, the County did not issue any Administrative Waivers for quality and quantity. No qualitative or quantitative waivers were granted during FY 2019 period.

c. *Stormwater Management construction inspection information is to be maintained according to COMAR 26.17.02 for all ESD treatment practices and structural stormwater management facilities including the number of inspections conducted and violation notices issued by Charles County.*

FY 2019 Status

In accordance with COMAR 26.17.02.10 Construction Inspection and Enforcement, County personnel perform the various inspections, as outlined for the ESD treatment practices and structural stormwater management facilities. The County also reviews the as-built plans and certifications, including the submission of the Notice of Construction Completion Forms, which were previously updated to collect the technical data associated with each device/facility that are provided to the Charles County Soil Conservation District.

The County maintains the inspection reports, violation notices and associated documents within each project's individual Development Services Permit file. The number of major stormwater management facility construction inspections in FY 2019 was 1,365. The number of residential micro-stormwater practice construction inspections was 4,929. (The number of residential micro-stormwater practice inspections increased substantially, due to now counting inspections of each practice rather than the site as a whole.) There were no stormwater construction violations or stop work orders.

d. *Stormwater Management preventative maintenance inspections to be conducted according to COMAR 26.17.02, of all ESD treatment systems and structural stormwater management facilities at least on a triennial basis. Documentation identifying the ESD systems and structural stormwater management facilities inspected, the number of maintenance inspections, follow-up inspections, the enforcement actions used to ensure compliance, the maintenance inspection schedules, and any other relevant information shall be submitted in the County's annual reports.*

FY 2019 Status

The County continues in conducting preventative maintenance inspections of all stormwater management (SWM) devices on a triennial basis. During FY 2019, a total of 1,416 preventative maintenance inspections were performed. These inspections were comprised of 246 first year inspections, 676 third year inspections, 408 compliance inspections (i.e. follow-up to 90 and 60-day letters identifying corrections needed), 67 enforcement inspections associated with warning letters stating corrective action within 30 days or legal action will be pursued, and 19 inspections associated with violations being handled by the County Attorney's Office for legal action.

Detailed inspection reports of each inspection are maintained within the project file folder. Two types of certified letters are typically sent to initiate compliance. No major structural problems were found.

During FY 2019, a total of 259 devices that were previously identified as unacceptable, were brought into compliance. A copy of the County's dataset showing inspections during FY 2019 is included in Appendix B. The entire urban best management practices (BMPs) inventory and inspection dataset is included in the enclosed MS4 geodatabase.

Since 1990, the SWM Maintenance Inspections Inventory designates "S" for satisfactorily maintained SWM devices and "U" for unsatisfactorily maintained devices. We believe that the vast majority of the issues pertaining to a "U" rating of a SWM device do not affect the function of the SWM device and therefore are listed as "pass". Beginning in Calendar Year 2012 a "Pass" has been entered in the BMP Status column to indicate that the device is "performing", as a more descriptive designation, so that one can easily determine if the function of the device is compromised by simply reviewing the database.

SWM devices that receive a "U" or "unsatisfactory" designation during a triennial maintenance inspection primarily fall into this category due to the lack of maintenance of the devices. The types of maintenance that is required usually includes, but not limited to the following: mowing, safety fence repairs, removal of woody vegetation, in-flow & out-flow protection repair and minor erosion/stabilization. While these types of maintenance issues still require the structure(s) to be classified as "unsatisfactory", it is the opinion of the Department of Planning and Growth Management (Department) that the pond's (or other type of SWM device) performance is not substantially degraded in most cases.

The following table summarizes the information found in the Stormwater Inspection dataset. Facilities found acceptable and unacceptable for FY 2019 are reported based on their status. Totals for Fiscal Years 2015 through 2018 are also provided in the following table for comparison.

Table 3: Summary of Stormwater Management Device Inspections Fiscal Years 2015 - 2019

Fiscal Year	2015	2016	2017	2018	2019
Total projects inspected*	295	408	276	395	473
Total SWM devices inspected*	708	980	610	918	1,198
Total inspections performed including re-inspections*	792	1,452	830	1,061	1,416
Acceptable SWM inspections*	432 (61%)	583 (40%)	461 (56%)	661 (63%)	920 (65%)
Unacceptable SWM inspections*	276 (39%)	869 (60%)	369 (44%)	400 (38%)	496 (35%)

* Each project may contain more than one stormwater facility and/or practice. The number of inspections is higher than the number of facilities and practices, due to repeat inspections.

The data in this section is captured is included in the enclosed MS4 Geodatabase as follows:

- Number of various types of stormwater plan reviews, and construction inspections are in the *SWM Table*,
- New development BMPs are in the *BMP Table,* and
- BMP Maintenance inspections are in the *BMP Inspections Table.*

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall continue to be maintained and implemented in accordance with Environmental Article, Title 4, Subtitle 1, Annotated Code of Maryland. County activities shall include the following items A-D.

a. Implementing program improvements identified in any MDE evaluation of the County's erosion and sediment control enforcement authority.

FY 2019 Status

Every two years, MDE performs field reviews of active construction sites to review the County's implementation of the erosion and sediment control program. The County's current delegated program authority expires June 30, 2020.

b. Ensure that construction site operators have received training regarding erosion and sediment control compliance and hold a valid Responsible Personnel Certification as required by MDE.

FY 2019 Status

County sediment and erosion control inspection staff continues to verify that site operators hold valid Responsible Certification as required by MDE.

c. *Program activity shall be recorded on MDE's annual report database and submitted as required in Part V of the permit.*

FY 2019 Status

The following information is included in the enclosed MS4 geodatabase in *the Erosion Sediment Control Table.*

Table 4: Erosion and Sediment Control Table for Fiscal Years 2015 - 2019

Fiscal Year	2015	2016	2017	2018	2019
Number of Grading Permits Issued	821	818	798	1,226	1,039
Number Grading Permits Active (overall)	571	1,067	579	1,553	1,398
Disturbed Area for Active Grading Permits	3,269	3,372	3,930	4,322	3,619
Number of Other Permits Issued	28	22	35	33	16
Number of Other Active Permits (overall)	77	81	104	91	40
Disturbed Area for Other Active Permits	4,274	8,800	7,130	3,934	3,631
Number of Sediment Control Inspectors	8	6	6	6	5.25 FTE
Number of Supervisors	3	3	2	2	2
Number of Sediment Control Inspections	8,287	8,287	4,817	6,381	6,747
Number of Stop Work Orders Issued	27	18	8	33	53
Number of Fines Collected	27	15	8	33	30
Amount of Fines Collected	$11,232	$6,068	$3,544	$14,757	$24,327
Number of Violations	27	18	8	33	30
Number of Court Cases	0	0	0	0	0
Number of Sediment Control Complaints Received	20	26	49	51	11

3. Illicit Discharge Detection and Elimination

An inspection and enforcement program shall be implemented to ensure that all discharges to and from the MS4 that are not composed entirely of stormwater are either permitted by MDE or eliminated. Activities include:

a. Field screening at least 100 outfalls annually. Each outfall having a discharge shall be sampled using a chemical test kit. Within one year of permit issuance, an alternative program may be submitted for MDE approval that methodically identifies, investigates, and eliminates illegal connections to the County's storm drain system;

b. Conducting annual visual surveys of commercial and industrial areas for discovering, documenting, and eliminating pollutant sources. Areas surveyed shall be reported annually.

c. Maintaining a program to address and, if necessary, respond to illegal discharges, dumping, and spills;

d. Using appropriate enforcement procedures for investigating and eliminating illicit discharges, illegal dumping, and spills. Significant discharges shall be reported to MDE for enforcement and/or permitting; and

e. Reporting discharge detection and elimination activities as specified in Part V. of the permit.

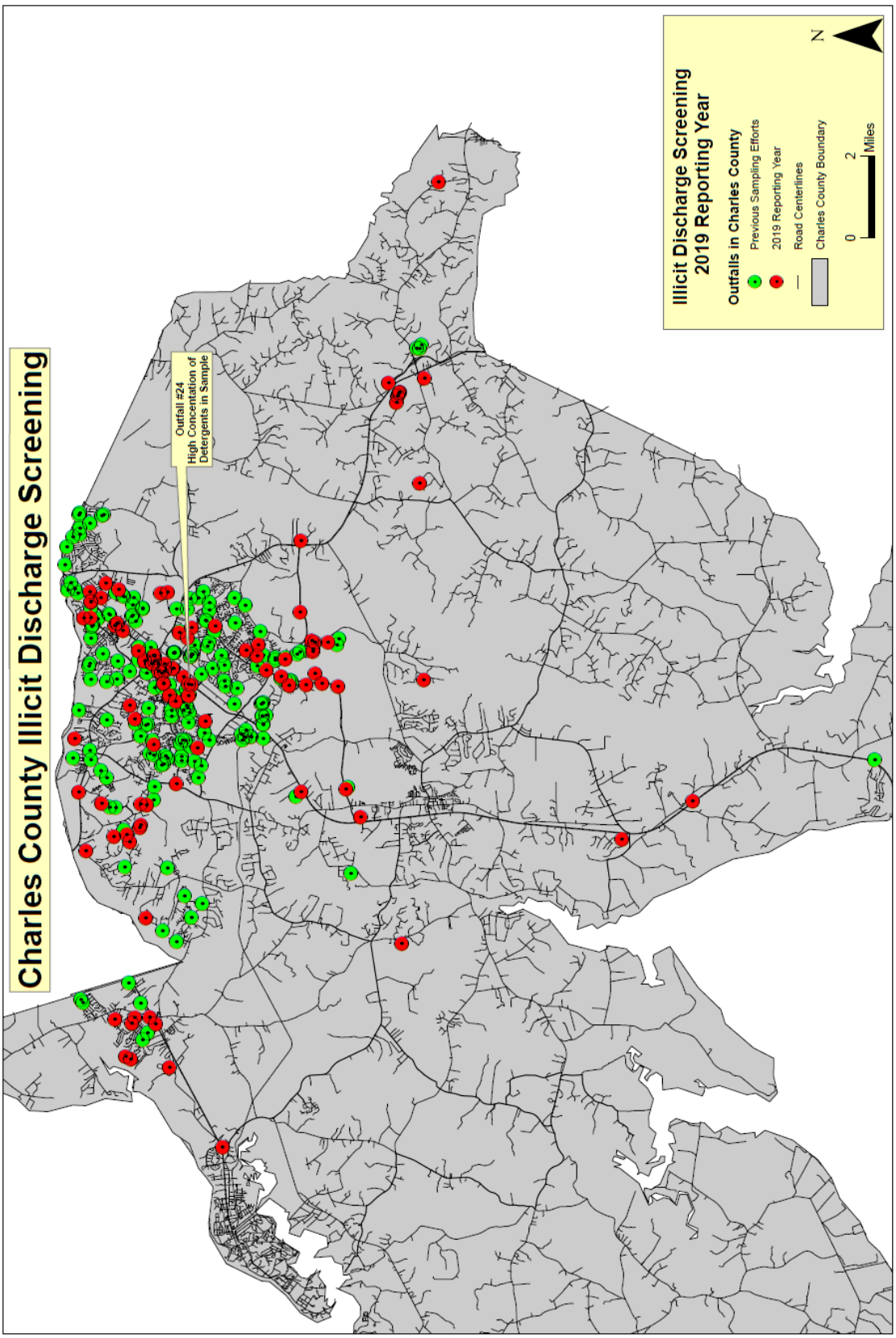
FY 2019 Status

Illicit Connection Detection Field Screening

During the FY 2019 screening, 100 sites were sampled. This includes 10 draining industrial areas, 44 draining commercial areas, and 46 draining residential areas. A map of the outfalls sampled follows on page 17.

As part of the County's stormwater database updates, stormwater infrastructure including structures and pipes are mapped countywide. Based on the County stormwater mapping and predominant land uses a total of 32 new potential major outfalls were identified throughout Charles County during the 2019 reporting year. For the 2019 reporting year, all 32 potential major outfalls were inspected. Previously mapped outfalls that were not sampled during the 2017 reporting year and 2018 reporting year were also selected for screening in 2019.

The screening was conducted in June of 2019. A two-person field crew visited each site following 72-hours of dry weather. The physical condition of each site was recorded on field sheets. If a dry-weather flow was present, a sample was taken and tested with a Hach chemical test kit. Tests were conducted for pH, detergents, chlorine, copper, phenols, temperature, ammonia nitrogen and nitrate nitrogen. When a chemical test was conducted, and the results


Charles County Illicit Discharge Screening
Outfall #24
High Concentation of
Detergents in Sample
Illicit Discharge Screening
2019 Reporting Year
Outfalls in Charles County
Previous Sampling Efforts
2019 Reporting Year
Road Centerlines
Charles County Boundary
0
2
Miles
N

showed a high concentration for any contaminant, the site was retested after 4 hours but within 24 hours to verify the results.

The results of the chemical test performed were compared with the accepted statewide averages described in *Dry Weather Flow and Illicit Discharges in Maryland Storm Drain Systems* (MDE, 1997). Using the statewide averages, the 1997 study provides a threshold for each constituent, based on watershed land use. The results from the chemical tests performed during the 2019-reporting year were compared with this threshold to determine which results are considered abnormal for each constituent, and to make recommendations as to which storm drain systems should be investigated further as having possible illicit connections. The thresholds listed were 0.4 ppm for chlorine, 0.17 for phenols, 0.21 for copper, and 0.5 ppm for detergents. No state-approved threshold limits exist for nitrate and ammonia. Based on EPA and USGS documentation, values of 2.0 ppm for both constituents appear reasonable. This is consistent with the high outlying values found in previous screening efforts. Review of past data shows that typical pH values in Charles County fall outside the standard threshold range of 6.5 to 8.5. Therefore, for the 2019 reporting year, the following thresholds were used to determine if an upstream investigation was necessary:

- pH outside the range 5.5-8.5
- >0.5 ppm Detergents
- >0.4 ppm Chlorine
- >0.17 ppm Phenols
- >0.21 ppm Copper
- >2.0 ppm Nitrate
- >2.0 ppm Ammonia

When a confirmed high concentration of a contaminant was found, field crews followed the storm drain system upstream attempting to locate the source of the contamination. Additional tests at upstream structures were conducted as needed in an effort to track the contamination upstream to the source, especially where two systems converged. For any outfall with flow, a brief inspection of the storm drain system is performed to indicate the source of the discharge.

All data collected during the illicit discharge screening is recorded in the enclosed MS4 geodatabase in the *IDDE Table*.

The results show that, of the 100 sites, 43 had observed flow. Of these, 20 had observed flow that was too small for a sample to be collected. For these outfalls, observed flow is set to no and water temperature and CFS flow are not filled out in the geodatabase since a sample is not collected. Of the remaining 23 sites where flow was able to be collected, 2 had detectable detergent concentration present. Outfall #283 had detergent concentrations below the threshold limit during the first inspection. A source of detergents was not located at the time of inspection. On 6/24/2019, Outfall #24 had detergent concentrations above the threshold limit

during the first and second inspections. On 6/26/2019, a third inspection was performed and the detergent concentration was found significantly lower than on 6/24/2019. A detailed report for Outfall #24 can be found in the Appendix C.

No concentrations of phenols or copper were detected at the sites where flow was able to be collected. Varying concentrations of ammonia and/or chlorine were detected at some of the sites where flow was tested; however, concentrations were not above the threshold limits during each first inspection. Detection of elevated concentrations of ammonia at Outfalls #46, #83, #159, #215, and #216 was attributed to extensive iron flocculent bacteria at the sampling location after upstream investigations indicated that the likely source is groundwater input.

Metal corrosion was present at 17 outfalls and 50 outfalls were found to either be backwatered or submerged. Spalling concrete was occurring at 2 outfalls. Moderate erosion was occurring at 7 outfalls. Outfalls #78 and #268 were exhibiting outfall damage due to sinkhole conditions and the end section being detached from the pipe. Algae was found at 47 outfalls, which may indicate excessive nutrients in the water. All sites inspected had acceptable clarity and color not indicative of pollution. Opaque and cloudy clarity results for several outfalls were due to suspended iron flocculent bacteria. Outfall #351 had a chlorine odor likely attributable to the pond it outfalls to being treated. All other sites inspected had acceptable odor.

Oil sheen and trash along with sediment and iron flocculent deposits were found at many sites.

The screening results are listed in the following table.

Table 5: Field Screening Results for Priority Outfalls

Outfall #	Problem
#24	High concentration of detergents on 1st and 2nd inspection
#78	Pipes appear to be failing at the endwall, sinkholes and caution fencing present
#268	End section is detached from the pipe with scour erosion, pipe invert is very corroded.

Commercial and Industrial Visual Surveys

During the FY 2019 screening, several portions of the County including US 301 near Waldorf, St. Charles, La Plata, and Newburg, Port Tobacco, MD 6 east of La Plata, Pomonkey, MD 225 near Mattawoman Creek, and MD 225 south of Pomfret were targeted for visual surveys. The visual surveys were conducted in late June of 2019. An estimated 200 tax parcels were visually assessed in the field. The map on the following page shows the survey locations.

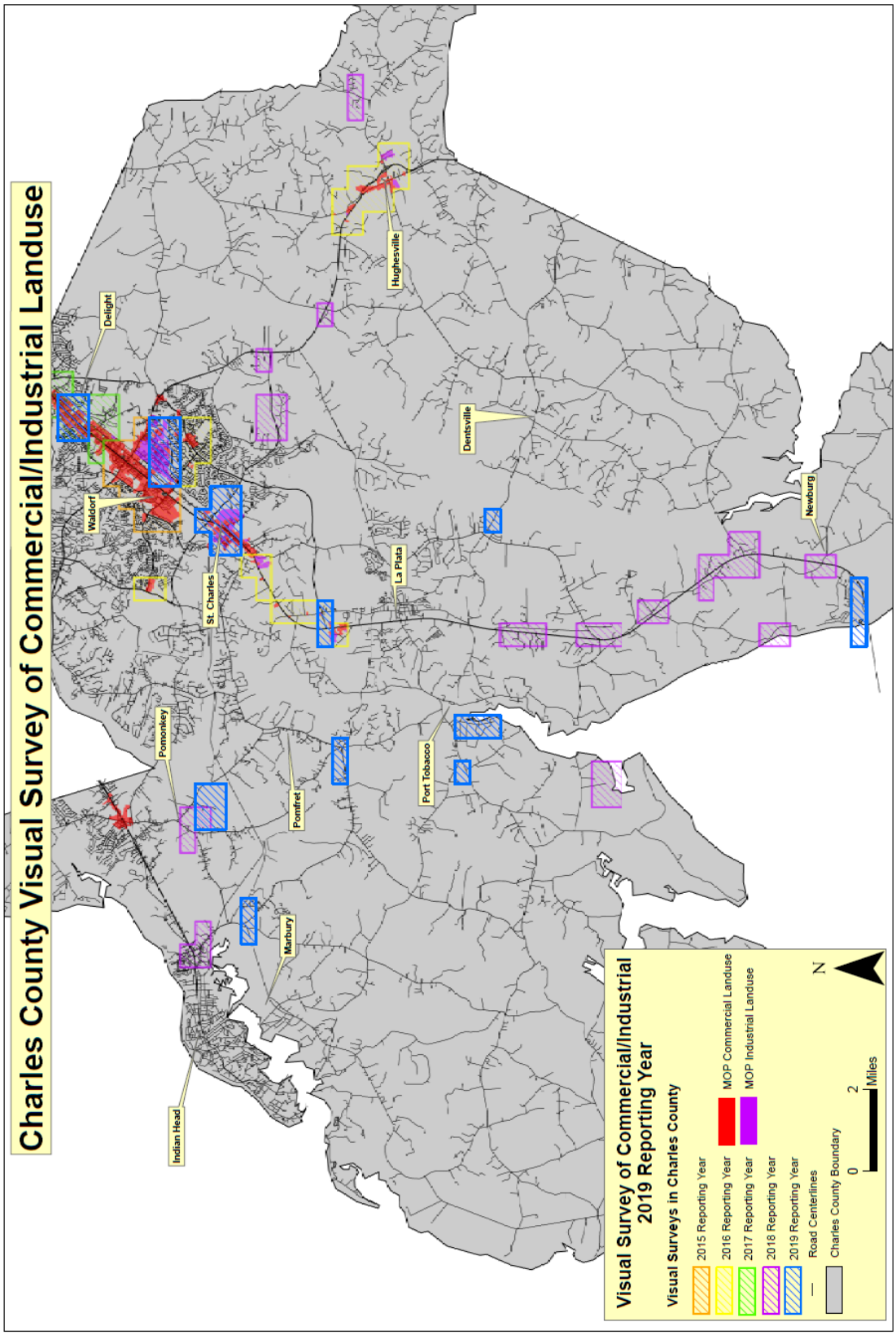
Within this target area, Maryland Department of Planning (MDP) 2010 Land Use mapping was

utilized to visually assess commercial and industrial properties. Each property was visually assessed from a vehicle or on foot depending on access and safety. If no visible practices or conditions that would produce pollution to nearby storm drain inlets or watersheds are observed, then no documentation is created. If visible practices or conditions that would produce pollution to nearby storm drain inlets or watersheds are observed, then field crews document the conditions by recording address/location, business name, property owner (if available), notes, and pictures on a Routine Watershed Inspection Field Sheet. Maps of the target area displaying the MDP land uses are created by the field crew to keep track of the properties that have been visually assessed and to mark the location of violations.

Within the above areas, 14 businesses were documented as having practices or conditions that would produce pollution to nearby storm drain inlets or watersheds in FY 2019. These businesses and their practices or conditions are listed below in Table 6. Detailed reports for each can be found in Appendix C and enforcement activity is described in the following section.

Table 6: Visual Survey of Commercial and Industrial Land Use – Potential Pollution Sites FY 2019

Site Name	Problem
Enterprise Rent-a-Car	Washing cars in parking lot into storm drain.
Legacy Restaurant	Leaking grease barrel behind restaurant.
United Site Services	Found to be pressure washing portable toilets with detergents in their parking area.
Atlantic Cycle & Power	Potentially hazardous drums (oil) that are not protected.
Elite Hauling, Inc.	Potentially hazardous drums (Ethylene Glycol engine coolant) that are not protected or sealed properly.
Alliance Concrete Corp.	Potentially hazardous containers (oil) without any protection. The drums and buckets are leaking solutions that have saturated the surrounding area.
Boswell Auto Service	Potentially hazardous containers (oil drum) sitting on parking lot pavement without any protection.
Bryans Road Tire & Auto Service	PVC pipe draining from the building discharging solution under rusted dumpster causing pavement staining and runoff.
Capital Welding, Inc.	Potentially hazardous drums (flammable liquid) that are not protected or sealed properly.
Carrier Enterprise	Equipment being power washed in the parking lot.
Innovative Construction, Inc.	Water staining with detergents in the parking lot of Innovative Construction, Inc. with no direct source.
JESCO Equipment	Construction equipment being power washed in the parking lot behind building leading towards bioretention.
Love Concrete & Masonry	Unknown discolored discharge outside of the garage door.
McConnell Pool, LLC	Potentially hazardous unprotected plastic containers (oil).


Charles County Visual Survey of Commercial/Industrial Landuse
Delight
Waldorf
St. Charles
Hughesville
Dentsville
La Plata
Newburg
Pomonkey
Pomfret
Port Tobacco
Marbury
Indian Head
Visual Survey of Commercial/Industrial
2019 Reporting Year
Visual Surveys in Charles County
2015 Reporting Year
2016 Reporting Year
2017 Reporting Year
2018 Reporting Year
2019 Reporting Year
Road Centerlines
Charles County Boundary
MOP Commercial Landuse
MOP Industrial Landuse
0
2
Miles
N

Enforcement Activities

Charles County followed up on the suspected illicit discharges listed in the table below. Per the Illicit Discharge and Detection Elimination Standard Operation Procedures, the County tracks the investigations using an assigned case number. See the 2016 NPDES MS4 Annual Report for a copy of the standard operating procedures.

Table 7: Investigations of Suspected Illicit Discharges in Fiscal Year 2019-2020

Date Received	Description	Name/County Tracking #	Action
5/13/2019	Sediment leaving site and covering roadway	VIOL-190017	Stop work order issued. Site cleaned and passed inspection on 5/14/2019.
6/26/2019	High concentrations of detergents.	Outfall #24	Investigated by County Utilities and sewer leaks were ruled out. No obvious sources and appears was a one-time event.
7/3/2019	Washing cars in parking lot into storm drain behind building.	ZV-190255	Violation letter sent and activity has ceased per 9/20/2019 inspection.
7/8/2019	Leaking grease barrel behind restaurant.	ZV-190256	Violation letter sent and activity has ceased per 9/20/2019 inspection.
9/11/2019	Discovered oil drums that are not protected.	ILLD-000388-2019	Violation letter sent and 9/20/2019 inspection verified tanks were not in use.
9/18/2019	Oil containers without any protection. The drums and buckets are leaking solutions.	ILLD-000389-2019	Violation letter sent and owner responded. Follow-up to occur with tenant for resolution.
9/18/2019	Pressure washing portable toilets inside and out with detergents in their parking lot.	ILLD-000393-2019	Violation letter sent and property manager met with County's Sanitary Sewer Engineers to determine solutions on 10/17/2019. Engineering plans to be submitted for permit.
9/18/2019	Hazardous drums (Ethylene Glycol engine coolant) that are not protected/sealed properly.	ILLD-000394-2019	Violation letter sent and 10/8/2019 inspection verified drums moved inside.
9/18/2019	Oil drum sitting on parking lot pavement without protection.	ILLD-000395-2019	Violation letter sent and 10/28/2019 inspection verified tanks were removed.
9/18/2019	PVC pipe draining from the building discharging solution under rusted dumpster causing pavement staining and runoff.	ILLD-000396-2019	Violation letter sent and 10/8/2019 inspection verified pipe discharging groundwater from sump.
9/18/2019	Flammable liquid drums are not protected or sealed properly.	ILLD-000397-2019	Violation letter sent and 11/8/2019 inspection verified barrels used for trash and will be labeled in the future.
9/18/2019	Equipment being power washed in the parking lot.	ILLD-000398-2019	Violation sent and applicant called 10/11/2019 to say this was a one-time event not related to the business.

9/18/2019	Water staining with detergents in the parking lot.	ILLD-000399-2019	Violation letter sent and owner notified tenants to desist any outdoor washing.
9/18/2019	Construction equipment power washed in the parking lot draining towards bioretention.	ILLD-000400-2019	Violation letter sent and 11/5/2019 inspection verified wash water collection system installed and in use.
9/18/2019	Unknown discolored discharge outside of the garage door.	ILLD-000401-2019	Violation letter sent and applicant called to explain hose is from dehumidifier. Inspector verified stain mark on pavement was paint.
9/18/2019	Plastic containers and oil drums that are not protected.	ILLD-000402-2019	Violation letter sent and 10/3/2019 owner will have used motor oil pumped.

In the recent past, enforcement efforts have focused on the resolution of the discharge of wash water at Outfall #26 (Speedy Clean Car Wash). County inspection personnel have met several times with the property owner to discuss the issue. In April 2017, County inspectors observed a wash water discharge into nearby stormwater BMP's from the car wash and a correction notice was sent to the owner. In June 2017, the County met with the owner and manager on-site and observed a wash water discharge again into nearby stormwater BMP's. From this discussion, the owner was to provide the County with a plan for remediation. Another meeting was held on-site in August 2017 with the County and the owner. The owner stated that water and detergent usage in two automatic wash bays have been reduced by 30-40% in order to eliminate overspray resulting in discharges to nearby stormwater BMP's. The County sent a letter confirming this resolution and will continue to monitor this site during future inspections. In 2019, detergent laden wash water was not observed draining to the storm drain system at Outfall #26.

For Outfall #83, which was found to have elevated levels of chlorine due to a water main leak in in 2018, which Charles County Utilities repaired June 2018. A follow-up investigation was performed in 2019, which confirmed that this violation has been resolved.

Proposed Program Improvements

For the FY 2019 screening, outfalls and routine surveys of commercial and industrial areas were performed County-wide as required by the County's NPDES MS4 permit. Since the County has expanded its storm drain infrastructure mapping County-wide, new outfalls and commercial/industrial areas can be identified before each future screening effort.

Future improvements may include updating the current protocol for commercial and industrial visual surveys. For the current permit term, the County has been utilizing Maryland Department of Planning (MDP) 2010 Land Use mapping data to assess where visual surveys will be conducted each year countywide. At this time, documentation is only produced by field

crews when visible practices or conditions that would produce pollution to nearby storm drain inlets or watersheds is observed. The creation of a commercial and industrial layer may be beneficial for the County in tracking areas for visual surveys. Hot spot forms or other visual survey forms could be developed to perform inspections on the properties contained within the commercial and industrial layer. This would provide documentation for specific properties whether pollution was present or not.

The Illicit Discharge and Detection Elimination Standard Operating Procedures should be updated to reflect the County's new permitting and case management system, EnerGov, which began operation in October 2018. Once the procedures are updated a staff training is proposed.

4. Litter and Floatables

Charles County is required to address problems associated with litter and floatables in waterways that adversely affect water quality. Charles County needs to evaluate current litter control problems associated with discharges from its storm drain system and develop and implement a public outreach and education program as needed on a watershed by watershed basis.

a. As part of Charles County's watershed assessments under Part IV.E.1 of this permit, Charles County will identify all litter control programs and identify potential sources, ways of elimination, and opportunities for overall improvement.

b. Within one year of permit issuance, as part of the public education program described in Part IV.D.6, Charles County will develop and implement a public education and outreach program to reduce littering and increase recycling. This includes:

i. Educating the public on the importance of reducing, reusing, and recycling;

ii. Disseminating information by using signs, articles, and other media outlets; and

iii. Promoting educational programs in schools, businesses, community associations, etc.

iv. Evaluating annually the effectiveness of the education program.

v. Submit annually, a report which details progress toward implementing the public education and outreach program. The report shall describe the status of public outreach efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.

FY 2019 Status

Litter Control Programs

The Charles County Department of Public Works, Environmental Resources Division, (DPW) has multiple litter control programs that have proven to be effective in combating litter.

The litter control crews routinely patrol the litter hot spots in the County, as well as respond to citizen complaints. In addition to the County-staffed litter crews, a contractor conducts daily or weekly cleanings for priority roads. The FY 2020 budget for the litter contractor crew remains at $57,000. In FY 2019, both contracted and County-staffed crews removed 152 tons of litter from the roads.

The Adopt-A-Road program allows residents to volunteer to clean up their county roads. A sign is placed on the adopted road in recognition of the group/individual that adopted it. The program currently has 80 roads adopted and 128 cleanings have been reported in FY 2019. Some inactive groups were removed from the program in order to attract more participatory groups.

The Potomac River Watershed Cleanup had over 512 volunteers that removed 13 tons of debris/litter from various beaches along the watershed. The County, in combination with local watershed organizations, supplied bags, vests, and litter grabbers, and provided trash removal.

Also, in FY 2019, DPW coordinated 10 Community Cleanups, in which Charles County residents volunteered to improve the landscaping of an area. Like Adopt-A-Road, the County supplied gloves, bags, vests, trash removal, litter grabbers and, if necessary, delivered mulch.

Litter Control Public Education

DPW has increased their efforts to educate the public on the importance of reducing, reusing, and recycling in numerous ways. In FY 2019, DPW's outreach consisted of: over 16 school visits, attendance at the Charles County Fair all four days in September, 8 newspaper ads, 2 brochures, mailed 60,000 resident brochures in their tax bill regarding household hazardous waste (HHW) recycling, and 19 news releases, all regarding the importance recycling and litter control.

There were also two outreach events that provided onsite, secure paper shredding, rain barrel workshops, and composting workshops. See the Public Education section in this report for the number of rain barrels distributed at the workshops. The budget for all public outreach and education was $77,700, including printing, marketing, community promotions, Geo-bin (composting bin) costs, and rain barrel subsidy.

In FY 2019, the County maintained its annual budget of $90,500 for household hazardous waste collection days. This contracted service provides citizens with a drop-off location on the first Saturday of every month.

Effectiveness of Litter Control Efforts

The latest finalized waste diversion rate is for Calendar Year 2017, which was 50%. The reduction of the waste diversion rate from 2016 to 2017 is attributed to the depressed secondary commodities market and closures of the Prince George County

Material Recovery Facility (MRF), which not only impacted the County cost to process recyclables, but prevented most haulers to from collecting single stream and cardboard from commercial sources.

The latest tentative diversion rate for Calendar Year 2018 from Maryland Recycling Act reporting is 51% but has not been finalized at this time. The slight increase of the rate is a good indicator of improving markets and effective outreach efforts.

5. Property Management and Maintenance

a. Charles County shall ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned municipal facility requiring NPDES stormwater general permit coverage. The status of pollution prevention plan development and implementation for each County-owned municipal facility shall be reviewed, documented, and submitted to MDE annually.

b. The County shall implement a program to reduce pollutants associated with maintenance activities at County-owned facilities including parks, roadways, and parking lots. The maintenance program shall include these or MDE-approved alternate activities:

- *i. Street sweeping;*
- *ii. Inlet inspection and cleaning;*
- *iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;*
- *iv. Reducing the use of winter weather deicing materials, equipment calibration, employee training, and effective decision-making; and*
- *v. Ensuring that all County staff receives adequate training in pollution prevention and good housekeeping practices.*

The County shall report annually on the changes in any maintenance practices and the overall pollutant reductions resulting from the maintenance program. Within one year of permit issuance, an alternative maintenance program may be submitted for MDE approval indicating the activities to be undertaken and associated pollutant reductions.

FY 2019 Status

County-Owned Facilities with Industrial Stormwater Permits

As of FY 2019, three County-owned municipal facilities require the NPDES industrial stormwater permit coverage. These facilities are the Charles County Wastewater Treatment Plant (WWTP), the Sanitary Landfill #2, and the Department of Public Works (DPW) campus. All three facilities have active SWPPPs (Stormwater Pollution Prevention Plans). We are currently awaiting finalized versions of the 12-SW-A.

At all three facilities, routine inspections are conducted. At a minimum, on a quarterly basis, quarterly visual assessments and routine facility inspections are completed. Monthly, non-stormwater discharge assessments and routine monthly inspections (focused on spill prevention) are conducted. There are also annual staff trainings and comprehensive site evaluations completed. More information is under the Staff Training section below.

The Municipal Facilities Narratives are in Appendix D, and the *Municipal Facilities Table* is included in the enclosed MS4 Geodatabase.

Street Sweeping

In FY 2019, the Roads Division (Roads) swept 430.7 miles of Charles County roadways, mostly within highest traffic and residential areas. The hired contractor typically uses one to three trucks when they mobilize and typically use a 2006 or 2016 Freightliner Broom Bear sweeper. Tonnage collected from sweeping was 174 tons and the FY 2019 budget for street sweeping remains at $100,000.00. Roads tries to request a 10% increase for all line items every budget year regarding the Watershed Protection and Restoration Fund.

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Miles Swept	200.3	403.18	422.53	430.7	403.5	TBD
Debris Removed	198 tons	213.1 tons	192 tons	167 tons	174 tons	TBD
Sweeping Expenses	$48,750	$50,682	$50,705	$100,632	$84,585	$100,000 (budgeted)

The *Alternate BMP Polygons* feature class containing street sweeping information, is in the enclosed MS4 Geodatabase.

Inlet Inspection, Repair and Cleaning

The weight of material removed from storm drain inlets cleanings is 114.3 tons. FY 2019 budget for inlet cleaning was $90,000 and an additional $210,000 for inlet and catch basin inspections and repairs. Actual expenditures vary from budgeted amounts. Budgets have been increased for FY 2020 as indicated in the tables below.

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Pipes/Inlets Vacuumed	247/221	297/189	75/46	88/82	51/68	TBD
Debris Removed	36.1 tons	57.4 tons	30.6 tons	29.5 tons	114.3 tons	TBD
Inlet Cleaning	--	$75,613	$78,104	$90,359	$98,714	$120,000 (budgeted)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Inlets Repaired	57	75	70	24	44	TBD
Inspection and Repair Expenses	$60,473	$67,021	$64,120	$211,541	$211,072	$270,000 (budgeted)

Mosquito Control expenses associated with County owned property are funded by the Watershed Protection and Restoration Fund since FY 2018 as they are part of maintaining the drainage system. FY 2018 expenses were $4,000, and for FY 2019 and FY 2020 expenses are $6,000 for each year.

The *Alternate BMP Polygons* feature class containing inlet cleaning information, is in the enclosed MS4 Geodatabase.

County Owned Stormwater Management Facility Inspection and Maintenance

The County owns and maintains approximately 500 stormwater management facilities for the purposes of managing stormwater runoff from county roads, parking areas and buildings. These facilities must be inspected and maintained on a regular basis to ensure proper functioning.

In FY 2019, the County increased the budget to $300,000 with the intent of providing annual maintenance for these facilities for consistent performance and to reduce costly repairs. Expenses exceeded the budget in FY 2019 and in FY 2020 the budget was increased. Facility repairs are typically per Planning and Growth Management's inspection findings.

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
# Facilities	28	55	8	302	335	TBD
Facility Repair Expenses	$71,250	$120,033	$86,707	$266,163	$371,004	$350,000 (budgeted)

Vegetation Management

In FY 2019, Roads did not apply any herbicide. Roads elected to weed-eat problem areas (around guardrails, for example) rather than spraying. They also had difficulty locating a licensed contractor to conduct spraying. Roads does not apply any other chemicals or pollutants for roadway vegetative management.

The Parks and Grounds Division (Parks) is responsible for maintaining all parks, sport facilities, and lawn care surrounding government buildings within the County. In FY 2015, Parks converted from a quick release to slow release fertilizer for all applications. Coated/slow release carrier minimized risk of fertilizer moving into ground and surface water through and less likelihood of runoff. Also, the use of slow release fertilizer has reduced the frequency of grass mowing. Parks has also stopped the usage of fertilizer that contains phosphorus entirely. The latest saturated soil analysis was conducted on May 7, 2019.

Parks used 4.5 tons of fertilizer over 80.3 acres at the White Plains Golf Course through FY19. No fertilizer was applied at parks in FY 2019 due to the amount of precipitation. Turf was self-maintained and fertilizer was not needed.

In FY 2019, Parks used 42.6 gallons of herbicide (Round-Up, EPA#: 524-549) on 105 acres, which was primarily used around parking lots and chain-link fences at the parks, and government building sidewalks. They use a concentration of 2.1 oz per gallon on average.

Winter Weather Deicing

Rather than spreading salt throughout the storm event, Roads Division waits until the storm has nearly passed to plow and spread salt to increase its effectiveness and decrease runoff. In FY 2019, Roads staff and trained contractors were mobilized for 6 storm events. A total of 4,000 tons were dispersed from all four salt domes throughout the county. No pretreatment compounds are used on county roads, such as MgCl and KCl. Roads strictly uses NaCl, or granular salt.

Salt spreaders are calibrated before and after their use to ensure they are working effectively. Staff is also trained on proper salt-spreading techniques and use before the beginning of each winter season. Last FY 2019's snow meeting took place October 17, 2018. If needed, the staff is trained throughout the season, depending on the severity of winter weather. Snow Supervisors and their contractors know they must remove any excess salt from county roadways after a winter weather event. Roads is exploring a salt-tracking barcode scanner cell phone application where any person using salt from one of the county's domes will have to scan the amount of salt taken and returned. This way, if salt is improperly applied, the specific contractor can be re-trained or removed from the program.

Parks uses a de-icing compound called "Quad-Release", which is a blend of magnesium chloride, calcium chloride, sodium chloride, and potassium chloride on pedestrian walkways. While Parks cannot eliminate the use of this product due to public safety concerns, staff has been trained to reduce the amount used whenever possible. This included the following direction: shovel first prior to applying material, apply the recommended amount or less during large winter events, and close lesser-used walkways. Parks will also sweep sidewalks after the storm is over. Eight tons of Quad-Release snow melt was used on six miles of sidewalks throughout the winter season in FY 2019.

Staff Training in Pollution Prevention and Good Housekeeping Practices

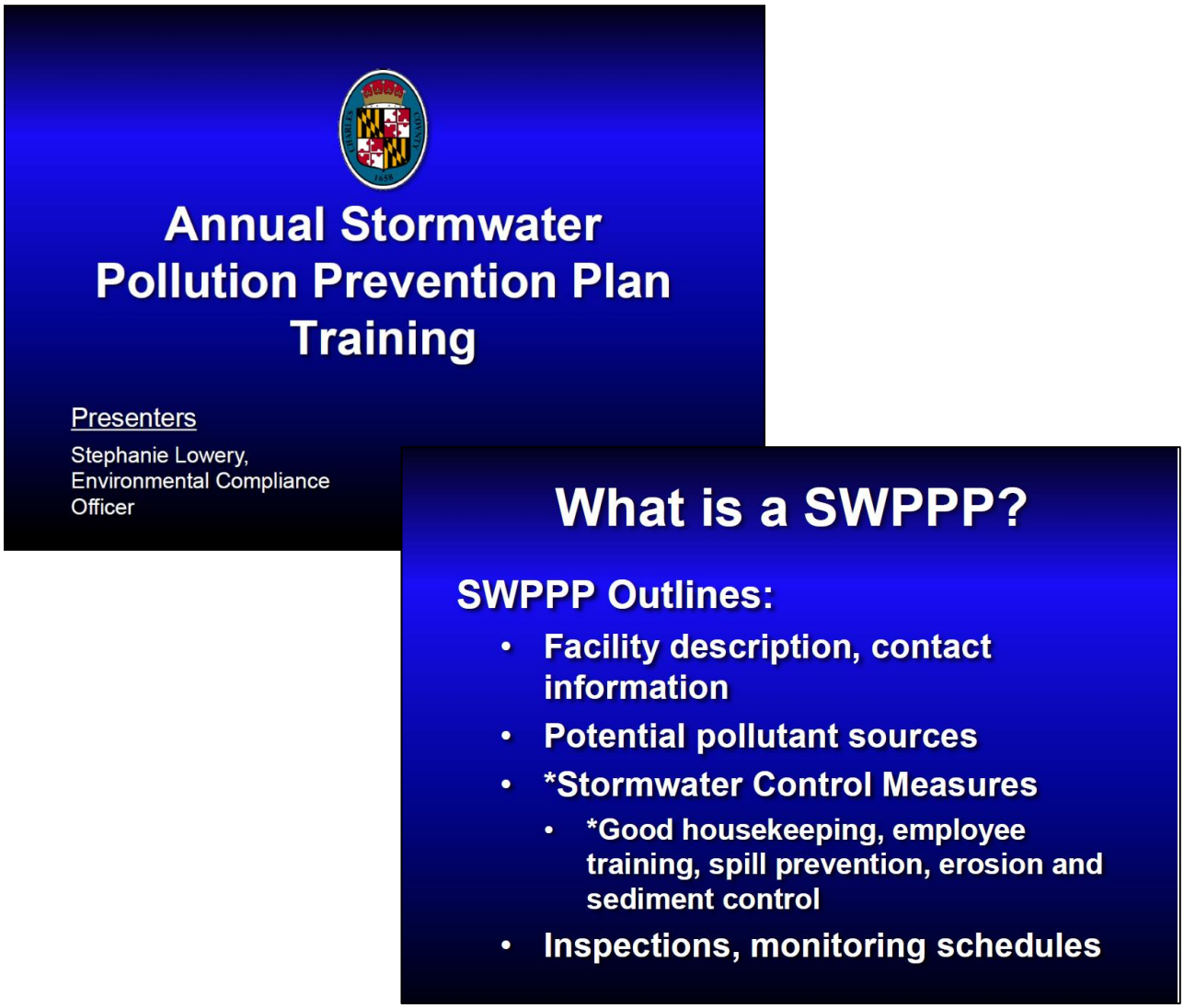
Per the Charles County Department of Public Work's Stormwater Pollution Prevention Plan (SWPPP), all applicable staff is trained annually on, but not limited to: spill prevention and control, proper fueling procedures, general good housekeeping practices, waste recycling, and used oil management. A PowerPoint presentation is developed and presented by the Environmental Compliance Officer to discuss the topics, as well as any specific examples of how to improve DPW's housekeeping practices. A record of all employees who have attended these trainings is kept with the SWPPP. Any employee that does not attend the annual training is briefed by their supervisor.

The Mattawoman Wastewater Treatment Plant (WWTP) conducted their annual SWPPP training on December 18, 2018 and have their upcoming training scheduled for December 2019. The SWPPP team takes applicable staff on their routine facility inspection and discusses good housekeeping practices. The SWPPP team also discusses spill response, which covers the gates to lock in an emergency and the locations of all spill kits. This year, a video discussing the importance of a SWPPP at the WWTP will be shown as well.

The following are the dates in which all other divisions of DPW received their annual SWPPP training:

- Landfill – January 22, 2019
- Buildings and Trades – January 17, 2019
- Vehicle Maintenance/Inventory Control – January 16, 2019
- Roads – January 23, 2019
- Parks and Grounds – January 24, 2019

All DPW divisions, aside from the WWTP, have their annual trainings scheduled for January 2020. Example training slides follow.


Annual Stormwater Pollution Prevention Plan Training
Presenters
Stephanie Lowery, Environmental Compliance Officer
What is a SWPPP?
SWPPP Outlines:
Facility description, contact information
Potential pollutant sources
*Stormwater Control Measures
*Good housekeeping, employee training, spill prevention, erosion and sediment control
Inspections, monitoring schedules

6. Public Education

a. Maintain a compliance hotline or similar mechanism for public reporting of water quality complaints, included suspected illicit discharges, illegal dumping, and spills.

b. Provide information to inform the general public about the benefits of:

i. Increasing water conservation;
ii. Residential and community stormwater management implementation and facility maintenance;
iii. Proper erosion and sediment control practices;
iv. Increasing proper disposal of household hazardous waste;
v. Improving lawn care and landscape management (e.g. the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.)
vi. Residential car care and washing; and
vii. Proper pet waste management.

c. Provide information regarding the following water quality issues to the regulated community when requested:

i. NPDES permitting requirements;
ii. Pollution prevention plan development;
iii. Proper housekeeping; and
iv. Spill prevention and response.

FY 2019 Status

Public education continued to develop in FY 2019. Outreach efforts included:

- Phone and online reporting for suspected illicit discharges
- Rain barrel and composting workshops
- Septic Pump-Out Reimbursement Program
- Web page outreach and updates
- Student outreach
- Chesapeake Bay Trust Outreach and Restoration Grant Program
- Cable TV and digital media Public Service Announcements (PSAs)
- Radio PSAs
- Movie Theater PSAs
- Storm Drain Stenciling/Marking Program

Charles County Watershed Protection and Restoration Program - Logo

Charles County's Watershed Protection and Restoration Program (WPRP) logo continues to serve as a branding mechanism for the program. The logo was developed in FY 2015 to project a united program whose staff is spread amongst two departments and several divisions. The logo can be seen on the program's web pages, outreach guidance documents, engineered drawings for restoration projects, brochures, and outreach presentations. The logo served as the program's brand on PSAs during FY 2019 including cable television, digital media, and movie theater spots. The logo is featured on promotional merchandise handed out at community and outreach events used to promote the program and increase interest in stormwater management and watershed stewardship.

Web Pages, Social Media, and Email media: www.charlescountymd.gov/watershed

Web Pages: In FY 2019, Charles County's WPRP continuously updated their web pages and added new content. Staff aims to achieve the following goals by keeping web content current for the WPRP program:

1. Increase transparency of the program, increase public awareness of County's efforts regarding watershed protection, stormwater management, and MS4 permit compliance.
2. Educate citizens on the basics of watershed, stormwater and stormwater management concepts.
3. Convey the role citizens in achieving improved water quality.
4. Encourage interest in the WPRP program, drive traffic to the web pages.

The program's website and associated web pages are organized into seven (7) major categories: Streams & Watersheds, Illicit Discharge Detection and Elimination, Stormwater, Wastewater/Septic System, Stormwater Remediation Fee, Regulatory Protection, Watershed Assessments & Restoration. Staff tracks traffic to the web pages using Google Analytics. Between July 1, 2018 and June 30, 2019, there were 7,512 hits to the program's web pages, up from 5,550 in FY 2018.

Analytics charlescountymd.gov
charlescountymd.gov

Go to report

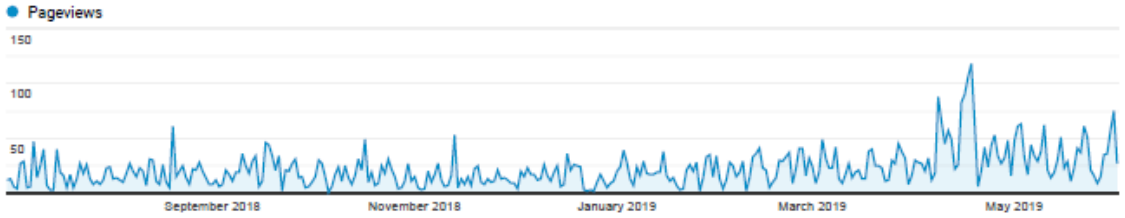
Content Drilldown

ALL » PAGE PATH LEVEL 1: /pgm/ » PAGE PATH LEVEL 2: /planning/ » PAGE PATH LEVEL 3: /watershed/

Jul 1, 2018 - Jun 1, 2019

All Users
0.25% Pageviews

NPDES Prior to April 2016



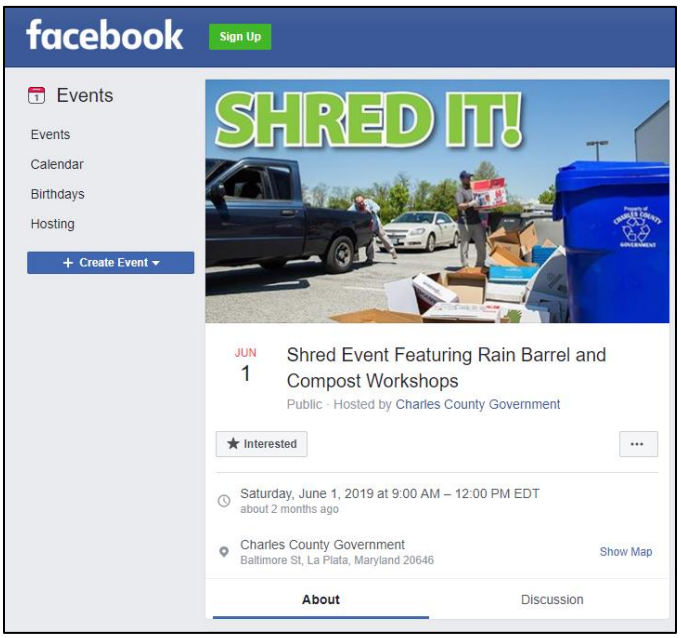
Page path level 4		Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
		7,512 % of Total: 0.25% (3,004,253)	5,872 % of Total: 0.27% (2,162,958)	00:02:39 Avg for View: 00:01:27 (81.87%)	60.08% Avg for View: 40.47% (48.45%)	50.43% Avg for View: 38.36% (31.47%)
1.	/septic-system-pump-out-reimbursement-program	949 (12.63%)	756 (12.87%)	00:02:51	53.05%	47.42%
2.	/watershed-restoration-protection	788 (10.49%)	547 (9.32%)	00:01:13	34.77%	24.24%
3.	/septic-system-upgrade-assistance	735 (9.78%)	575 (9.79%)	00:04:38	52.90%	58.10%
4.	/wastewater-and-septic-systems	629 (8.37%)	512 (8.72%)	00:03:10	49.24%	46.58%
5.	/stormwater-bmps-and-facility-inspection-maintenance	547 (7.28%)	423 (7.20%)	00:02:51	65.93%	61.61%
6.	/charles-countys-watersheds-0	476 (6.34%)	362 (6.16%)	00:02:54	59.38%	57.98%
7.	/rain-barrels	422 (5.62%)	350 (5.96%)	00:03:11	66.21%	55.69%
8.	/stormwater-remediation-fee	417 (5.55%)	283 (4.82%)	00:02:19	57.55%	32.37%
9.	/storm-drain-marking-stenciling-program	359 (4.78%)	297 (5.06%)	00:03:30	72.95%	67.69%
10.	/help-stop-water-pollution	312 (4.15%)	252 (4.29%)	00:01:25	84.34%	62.50%
11.	/septic-system-maintenance	283 (3.77%)	260 (4.43%)	00:02:34	66.67%	58.30%
12.	/what-watershed-0	249 (3.31%)	206 (3.51%)	00:02:56	74.21%	67.07%
13.	/how-stormwater-regulated	168 (2.24%)	109 (1.86%)	00:03:43	38.10%	37.50%
14.	/watershed-assessments	146 (1.94%)	93 (1.58%)	00:03:28	30.95%	39.73%
15.	/illicit-discharge-program	135 (1.80%)	101 (1.72%)	00:01:43	60.00%	37.04%
16.	/install-rain-garden	122 (1.62%)	91 (1.55%)	00:02:27	57.14%	65.57%
17.	/guidelines-maintaining-your-homes-septic-system	118 (1.57%)	98 (1.67%)	00:02:23	80.00%	62.71%
18.	/what-watershed-restoration	101 (1.34%)	92 (1.57%)	00:01:52	88.89%	70.30%
19.	/npdes-municipal-separate-storm-sewer-system-permit	85 (1.13%)	67 (1.14%)	00:03:35	36.96%	55.29%
20.	/regulatory-protection	66	49	00:00:50	33.33%	16.67%

	/regulatory-protection	(0.88%)	(0.83%)			
21.	/how-does-charles-county-address-stormwater-pollution	63 (0.84%)	56 (0.95%)	00:02:28	83.33%	33.33%
22.	/watershed-tmdl-total-maximum-daily-load-restoration-plan	48 (0.64%)	36 (0.61%)	00:01:13	58.82%	56.25%
23.	/watershed-health-monitoring	47 (0.63%)	40 (0.68%)	00:01:15	54.55%	29.79%
24.	/dumpster-maintenance	35 (0.47%)	31 (0.53%)	00:03:05	77.27%	65.71%
25.	/storm-drain-marking-stenciling-program?fbclid=IwAR3Kxnplngc0BC3xxUZ_AXh2r6uzcYr54prZmel6SoFgx-W3lhKMbQTTC0k	34 (0.45%)	28 (0.48%)	00:00:36	82.14%	82.35%
26.	/watershed-planning	33 (0.44%)	25 (0.43%)	00:03:13	31.25%	39.39%
27.	/how-county-restores-streams-retrofits-swm-facilities	21 (0.28%)	18 (0.31%)	00:00:30	60.00%	38.10%
28.	/what-stormwater	20 (0.27%)	18 (0.31%)	00:00:26	100.00%	20.00%
29.	/how-watersheds-affect-us-0	16 (0.21%)	14 (0.24%)	00:02:42	80.00%	37.50%
30.	/d2F0ZXJzaG	13 (0.17%)	13 (0.22%)	00:00:00	100.00%	100.00%
31.	/storm-drain-marking-stenciling-program?fbclid=IwAR2or3uAsJJojaLu6Gbfke28JMTdy0UGiG2bhaM6yYymMwhHGRQSVS6-0LE	9 (0.12%)	9 (0.15%)	00:00:00	100.00%	100.00%
32.	/storm-drain-marking-stenciling-program?fbclid=IwAR0uYQRv4pmzRt4SDR7WjbBdkFZgNUa51bbOU2hCHvxegLiKXYVjUbr2H_c	7 (0.09%)	6 (0.10%)	00:21:31	83.33%	85.71%
33.	/storm-drain-marking-stenciling-program?fbclid=IwAR34Swn9RwPEczib1LWRwnk4TbtbE7SD7lxGJrUH022bvFDqj3HiFEmpeY0	7 (0.09%)	4 (0.07%)	00:17:31	50.00%	57.14%
34.	/storm-drain-marking-stenciling-program?fbclid=IwAR1m5XmrEN90FloqSCPWgwAhOXqhRDDqV5VeCnw_pg5mEqCOTiqxlXAothU	5 (0.07%)	5 (0.09%)	00:00:00	100.00%	100.00%
35.	/stormwater-runoff-public-education-and-outreach	5 (0.07%)	4 (0.07%)	00:01:32	100.00%	40.00%
36.	/storm-drain-marking-stenciling-program?fbclid=IwAR1vOI9ORpp4F1eb24x895HbNVGkZ9hTN0R34B14EjnPijPSjAeqD1c5QYU	4 (0.05%)	4 (0.07%)	00:00:00	100.00%	100.00%
37.	/septic-system-pump-out- reimbursement-program	3 (0.04%)	3 (0.05%)	00:01:05	0.00%	33.33%
38.	/storm-drain	2 (0.03%)	2 (0.03%)	00:00:00	100.00%	100.00%
39.	/storm-drain-marking	2 (0.03%)	2 (0.03%)	00:00:00	100.00%	100.00%
40.	/storm-drain-marking-stenciling-program?fbclid=IwAR1uHSxd4lxba9yM21SngqVdloKTQm8E_2BbBDtFHQ5KMWsHnlXhGUQ7-es	2 (0.03%)	2 (0.03%)	00:00:00	100.00%	100.00%
41.	/storm-drain-marking-stenciling-program?fbclid=IwAR3zr_6FMDGyZd5p3mLrmzTOJyBD_95muiC3m0Xa9LNaH2kuR3OVZT-F6zU	2 (0.03%)	2 (0.03%)	00:00:00	100.00%	100.00%
42.	/charles-countys-watersheds-0?fbclid=IwAR2V-qGWfN93sdDbWoCmlVv45pHKkUl7bqxN3LnjCwebvUYFysm8hwVuolY	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
43.	/help-stop-water-pollution&arubalp=a6a3146f-a9b1-400d-b684-13e900b270	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
44.	/rain-ba	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
45.	/rain-barrels?fbclid=IwAR0xrgkoDgtn9xxbbCqDsuolHz0BSqqgjH8ghLdgJbe1QOlmriBd3bA09A8	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
46.	/rain-barrels?fbclid=IwAR2i4v5z8_jccyMAP--LhTZAf6TE4CNP-mfU46GKzbLluW72LRdZgDJp1y8	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
47.	/septic	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
48.	/septic-system-pump-out-reimbursement-program?fbclid=IwAR03x5_SJg8gOf5NnBU-uTydm4lc8wJwhQSGwRFqGSSNdDNxDeV1gEgkHJE	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
49.	/septic-system-pump-out-reimbursement-program?fbclid=IwAR0mOz-SdBL3MZlBeSCdx5bzatMn-ly0M1FuZlCswevKaLBn2SCzefJY0yc	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
50.	/septic-system-pump-out-reimbursement-program?fbclid=IwAR0mXMqJ6KNmfV4QpdvEiRsvEl3OBFHTAr5tKQ-77N-8ShLffNR8FqIldw0	1 (0.01%)	1 (0.02%)	00:00:00	0.00%	100.00%
51.	/septic-system-pump-out-reimbursement-program?fbclid=IwAR1F191HlGHrit9PVwEMsvhmHPBpXf01KJgsjfKJaRH3k6yO6v0pSoLyrbs	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
52.	/septic-system-pump-out-reimbursement-program?fbclid=IwAR1fzZ9B-IM-xsZ9_5QK3aWSnDe51trs7IFHozvj20Cq9FBrZXT_oUx8I	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
	/septic-system-pump-out-reimbursement-program?	1	1			

53.	fbclid=IwAR3hXj36wsDCu9sPtnwvQtLniYYtT0Tf4ysrEhWcJjJgmrrN8gdh0t-4itY	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
54.	/storm-	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
55.	/storm-drain-marking-stenciling	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
56.	/storm-drain-marking-stenciling-program?fbclid=IwAR06G9GuPn8tc_B-4USgaLHsmd8YvdrDy0mHxHaUjfjWij1b4YtWRQ4o-5s	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
57.	/storm-drain-marking-stenciling-program?fbclid=IwAR1aJkOFbKIvpa9gf6Q03efna3nQFDWWqTH8bj29Kf1d7unw6VGbY7P6H88	1 (0.01%)	1 (0.02%)	00:06:04	0.00%	0.00%
58.	/storm-drain-marking-stenciling-program?fbclid=IwAR1e0XVP24rH9op0ifyyyCLKlp3tyylkiCqbs-eaNaKFxMO4UqhT25qbNJ4	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
59.	/storm-drain-marking-stenciling-program?fbclid=IwAR1uU8BQRiNjZ3dAZ0utacRGliW8cioxEfyJC6KrFGOCOslWnL9CfNDksMY	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
60.	/storm-drain-marking-stenciling-program?fbclid=IwAR1WoK3QHk15h6nqX4e5k3XTF86EJ9N_HpvpQ2IBOzfzwm5PboSWGoltCK4	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
61.	/storm-drain-marking-stenciling-program?fbclid=IwAR25PnepXbiSzVkqMxIgyqLzWBjOfozV9DmQ9Tw0u5fPP75XgymWI3o6a7s	1 (0.01%)	1 (0.02%)	00:00:11	0.00%	0.00%
62.	/storm-drain-marking-stenciling-program?fbclid=IwAR2bN6kYJgawr7ZO0zRf7JTm1LiQ7UF5HHgF8h7iy_C_RJjT2ElqIoEaUw4	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
63.	/storm-drain-marking-stenciling-program?fbclid=IwAR2i14GiJc7nOWqoUWP2a-zXl-AZWtc5v2qbbjd84iTllrYvoMOxOJlwpD0	1 (0.01%)	1 (0.02%)	00:00:38	0.00%	0.00%
64.	/storm-drain-marking-stenciling-program?fbclid=IwAR2ypbqhq7L1cc-lWbUeOVi1ENk_NqXZiZC_c5Qum1dD5KGhaJLPty3gpic	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
65.	/storm-drain-marking-stenciling-program?fbclid=IwAR3H4j3BTFsA5Zb-fzbuDP8g5kKWxi4GJdliyscdcXS6wfpiSIUjGN-EQu0	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
66.	/storm-drain-marking-stenciling-program?fbclid=IwAR3lii-MPf36_EZUXqp0we3X4Dvr4eHQ7GEvUUfvqb3h6p8Ih4EpNG9oTBs	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
67.	/storm-drain-marking-stenciling-program?fbclid=IwAR3tCIKdznCs7cSAOpfO-SYR9ClahOuvR9URDVOS8fYmcdE9ZUdOMQFbFd4	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%
68.	/Z3VpZGVsaW	1 (0.01%)	1 (0.02%)	00:00:00	100.00%	100.00%

Rows 1 - 68 of 68

Social Media: The WPRP uses the County's Facebook page to reach out to citizens and promote educational materials, events, and programs associated with the WPRP program. Events like rain barrel workshops are shared on Facebook to build public awareness and participation in programs.



E-Mail Media: News releases from the Charles County Media Services Division alert citizens about upcoming events and inform the public about accomplishments and efforts of the Watershed Protection & Restoration Program. News Releases during FY 2018 advertised the rain barrel, composting, and shred events held in September 2017 and June 2019.

Charles County Government
NewsRelease

FOR IMMEDIATE RELEASE
News Release #2019-046
Tuesday, April 16, 2019, 10:55 a.m.

FOR MEDIA INQUIRIES ONLY:a
Ms. Donna Fuqua, Public Information Specialist
Office: 301-885-2779
Email: Fuquad@CharlesCountyMD.gov

Shred Event Featuring Rain Barrel and Compost Workshops to be Held June 1

The Department of Public Works is hosting an environmental outreach event on Saturday, June 1 from 9 a.m. to noon in the Charles County Government Building parking lot (200 Baltimore Street, La Plata). Backyard composting and rain barrel workshops, as well as free document shredding are available. Advance registration for workshops is required.

Charles County Government and the University of Maryland Extension staff are offering one-hour workshops for rain barrels and composting. The first rain barrel and compost bin workshops begin at 9:30 a.m.

Shred Event

- Free, secure, on-site shredding services available from 9 a.m. to noon.
- Bring up to five boxes (per vehicle) of personal documents for shredding and recycling.
- Event is for Charles County residents only.
- For more information, call the Department of Public Works' Environmental Resources Division, 301-932-3599 or 301-870-2778.

Rain Barrel Workshop

- Take home a rain barrel and learn proper in-home installation techniques, practical uses for rain barrels, and how to reduce the impact of runoff on local waterways.
- Become eligible for a stormwater remediation fee credit.
- Advance registration is required. Register at https://go.umd.edu/CCRBJune12019, or for more information, call Erica Hahn at 301-396-5237 or Jackie Takacs at 240-393-6508.

1

Tax Bill Inserts

In the summer 2019 tax bills, an educational insert was included that featured Max the dog. Max is also featured in the County's public service announcements. The title of the educational insert was "Scoop the Poop Every Time!" Text from the back of the insert is included on the following page.

You can help by SCOOPING the POOP EVERYTIME!

Decaying pet waste is NOT a good fertilizer. Pet waste carries bacteria, viruses, and parasites that can threaten human and wildlife health.

Scooping the poop prevents harmful nutrients and bacteria from entering Charles County's waterways and the Chesapeake Bay. This keeps our citizens and environment healthy, while also keeping our yards and shoes clean.

Charles County's storm drains do not connect to wastewater treatment facilities. Animal feces end up washing into rivers and streams and pollute the water. In some cases, the pollution is so bad that fishing and swimming restrictions are put in place to keep people safe.

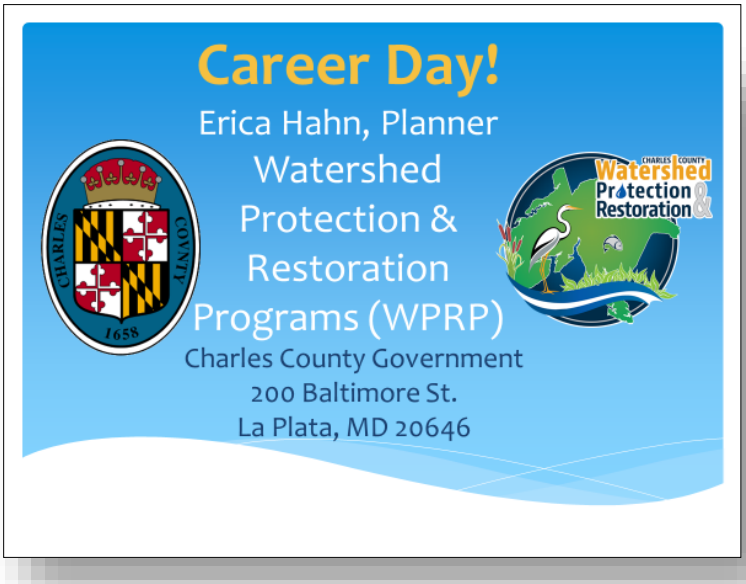
- ☑ Always clean up after your dog on walks. Remind neighbors and friends to do the same.
- ☑ Take multiple bags on walks… just in case.
- ☑ Dispose of pet waste using a bio-degradable bag OR flush waste down the toilet (*where it will eventually end up in a wastewater treatment plant*).
- ☒ Don't wait to scoop in your own yard — keep an eye out and scoop immediately.
- ☒ Do NOT throw pet waste in a compost bin.

For more information on how to help Charles County waterways, visit:

www.CharlesCountyMD.gov/Watershed

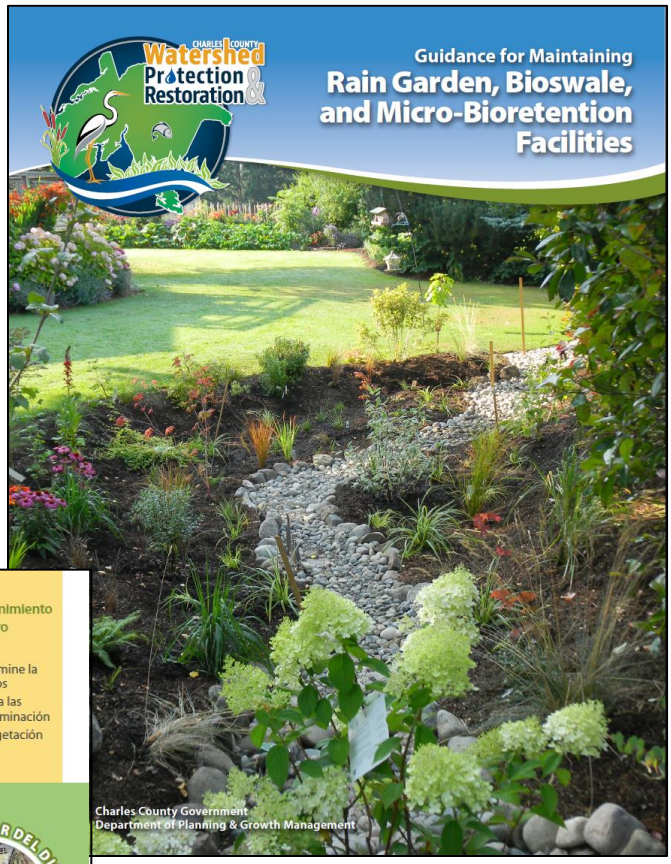
Student Outreach

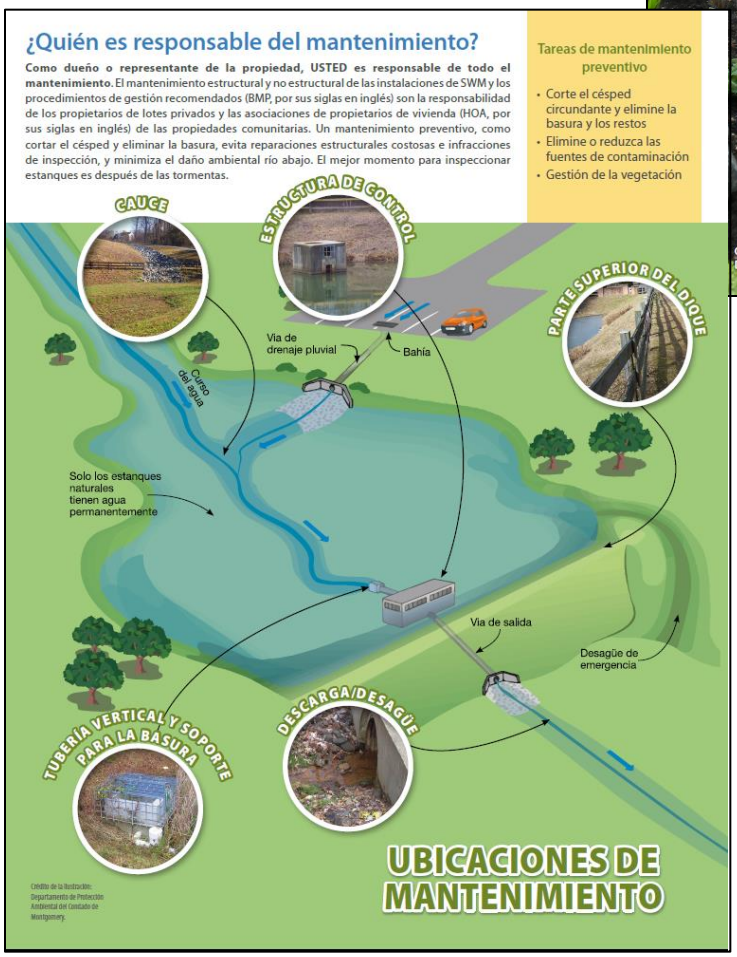
The WPRP continued outreach education within Charles County Public Schools during FY 2019. Staff attended two (2) Career Days at elementary schools and educated over 200 students about the Watershed Protection and Restoration Program (WPRP), watershed concepts, stormwater pollution, and what students can do to help protect water quality. Each presentation begins with a PowerPoint slideshow, followed by a demonstration using an EnviroScape watershed model.



Residential & Community Stormwater Management Implementation and Facility Maintenance (BMP Maintenance) Outreach

Charles County began developing stormwater BMP maintenance guidance documents in FY 2016. Ponds were the subject of the first document. Three additional guidance documents were developed in FY 2017: Rain Gardens, Bioswales, and Micro-Bioretention; Porous Pavement; and Dry Wells. In FY 2018, a Spanish language version of the Pond brochure was requested from the Roads Division who oversees County maintained BMPs. The Spanish version of the Pond brochure is now available for contractors and property owners in print and on the County's website.



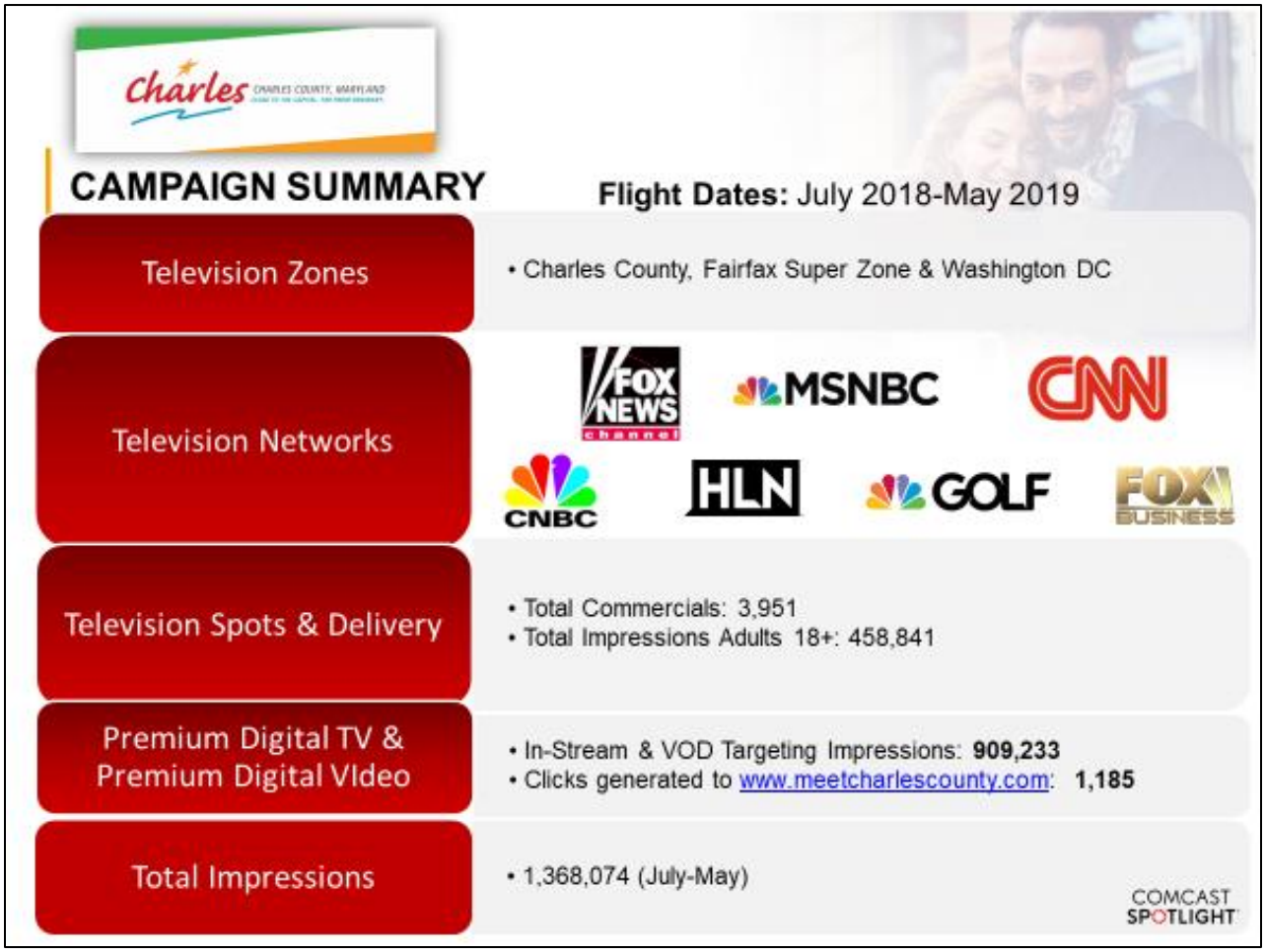


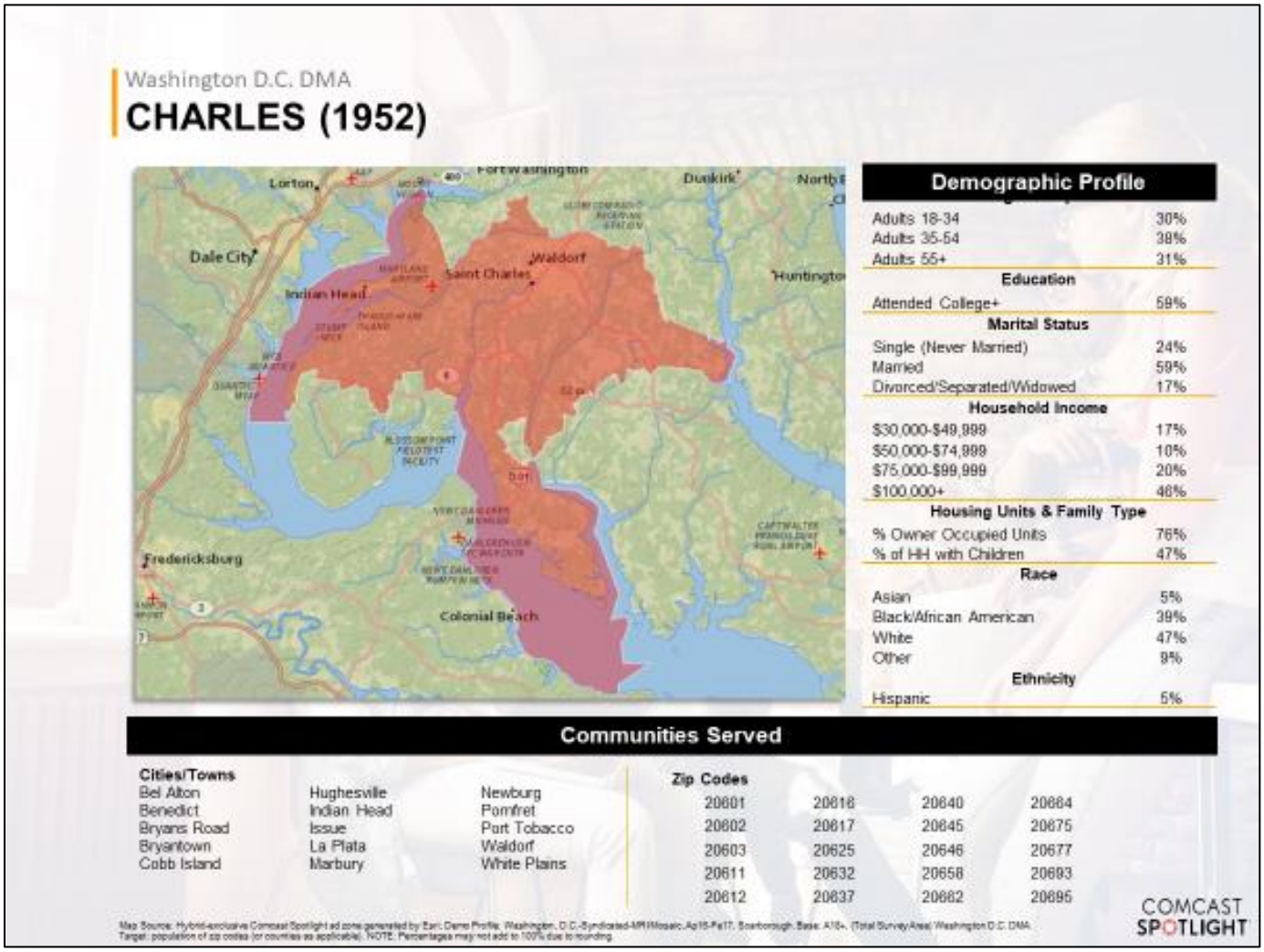
The guidance documents are featured on the WPRP web page under *Stormwater BMPs and Facility Inspection and Maintenance.* The intent of the guidance documents and web pages is to educate citizens, landowners, and stormwater professionals about BMP facilities and their maintenance. Guidance documents are given to property owners by County inspectors during BMP inspections. WPRP outreach staff hand them out at events like rain barrel workshops. The documents are available online on the Stormwater BMP and facility inspections maintenance page.

TV/Radio Media Outreach

COMCAST Spotlight/Charles County Government Television (CCGTV)

The Watershed Protection and Restoration Program (WPRP) TV and Digital Media campaign through Comcast Spotlight continued in FY 2019. All five spots that have been developed since FY17 were aired on Comcast cable, Verizon Fios and via Comcast Spotlight Video throughout FY 2019. The spots were aired on major networks including high profile programs such as Nationals baseball, Monday Night Football, FREEFORM and others. In total 6,210 cable spots and 133,118 digital impressions were delivered to Charles County citizens in FY 2019.





The PSAs address topics aimed at improving water quality and combatting stormwater pollution. The videos are embedded on the [WPRP Outreach web page] and can also be viewed via their YouTube links on the following table.

Table 8: Public Service Announcements Video and YouTube Links

	PSA	Video	Link
1	Did you know our water begins here?		https://www.youtube.com/watch?v=uIRUWaj1CdU

2	Personal responsibility for water pollution		https://www.youtube.com/watch?v=CAPyvvKfaQU
3	Scoop the Poop		https://www.youtube.com/watch?v=0eoGok53veY
4	Lawn Care		https://www.youtube.com/watch?v=yuDIas9cODc
5	How the Storm Drain Works – NEW in FY 2018		https://www.youtube.com/watch?time_continue=1&v=ct3Ncd401Ng
6	Yard Waste & Storm Drains NEW in FY 2019		https://youtu.be/N2PoUjmvFRk

Movie Theater PSA

In FY 2019, the WPRP again partnered with National Cinemedia, LLC, which coordinates advertising for AMC movie theaters, to broadcast the *How the Storm Drain Works* spot at the St. Charles Town Center movie theater in Waldorf. The campaign was 16 weeks long between April 2019 and July 2019 and delivered 9,737 plays with projected impressions of 145,215.

NCM

Audit Summary

Report Finished: 7/29/2019

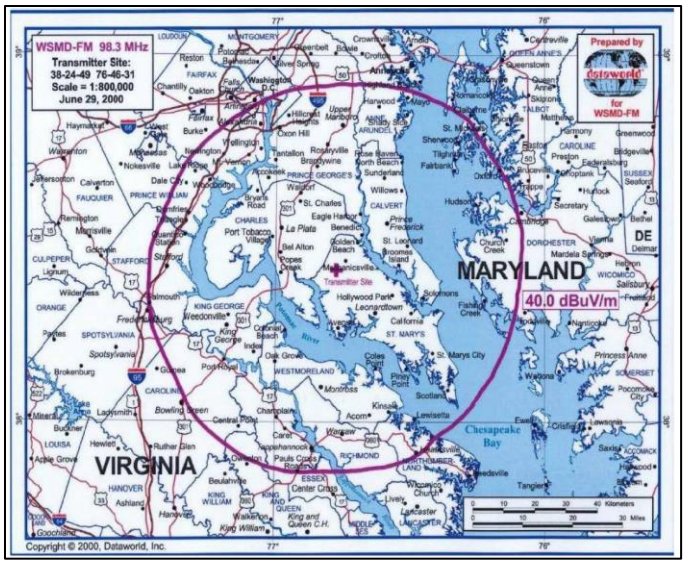
Charles Co. Watershed Protection & Restoration
Program Cinema Campaign

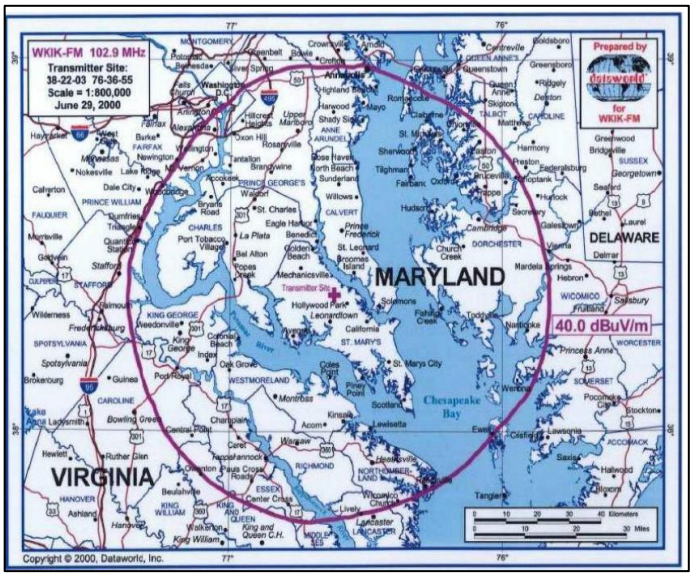
4/5/2019 - 7/25/2019

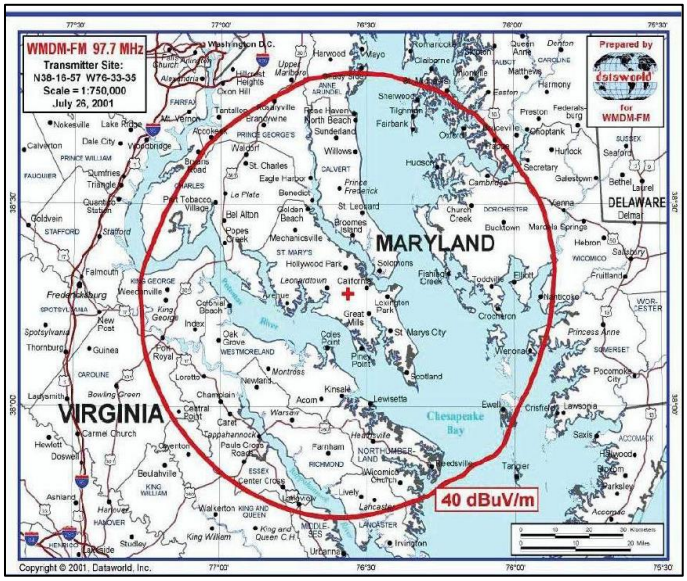
Theater #	Theater Name	Location	# of Plays	Projected Impressions
AMC2794	St Charles Town Ctr 9	Lobby	5,006	145,215
AMC2794	St Charles Town Ctr 9	Auditorium	4,731	
Totals			**9,737**	**145,215**

SOMAR Communications

The WPRP ran two radio Public Service Announcement (PSA) commercials during spring 2019. Both spots aired on stations broadcast by SOMAR Communications, Inc. of Lexington Park, MD. SOMAR is a local radio network serving southern Maryland. The spots rotated between three stations for nine (9) weeks and aired 192 times total, with 60% airing during drive time (5:30am-10am; 3pm-7pm). Stations included WSMD STAR 98.3 FM (Hot AC), WKIK 102.9 FM/WKIK 560 AM (Mainstream Country), and WMDM 97.7 FM The Bay (Classic Hits). The three stations encompass a wide range of music genres, appealing to a wide listening audience.







The spots' copy are as follows:

Charles County: Yard Runoff - Kid & Mom (or Dad) - 60 seconds

Kid: Hey mom, look at the rain running off our yard, where does it go?

Mom: Well, stormwater runs off our property into storm drains. Then it flows into our streams and rivers.

Kid: Geez, it must get really dirty.

Mom: Yup, runoff can have all sorts of stuff in it. Like oil from our cars, and fertilizers and pesticides from our yards.

Kid: And animal poop?

Mom: Even animal poop.

Kid: Ewww, all that goes to the river where we fish and swim? What can we do?

Mom: Well, you can pick up after our pets. I can maintain our cars so there's no leaks. And use less chemicals on our yard.

Kid: We shouldn't leave trash in the street either.

Mom: That's right! Keeping stormwater clean is important to all of us. We can ALL be the solution to water pollution.

Kid: Even kids!

Visit charlescountymd.gov/watershed to learn more. A message from Charles County Government Watershed Protection and Restoration Program.

Yard Waste – 60 seconds

Want to do your part to help the environment? Start in your own backyard. We mow our lawns, blow the clippings and leaves into the street and forget about them. Right? But they don't just stay there. Yard waste absorbs oil and dirt from the road surface before being washed into the storm drain. Then it globs together, starts to decompose and clogs the drains. Which causes backups and flooding. But it doesn't end there. The yard waste glob continues to pick up sediment, bacteria and garbage as it moves through the storm drain. When it reaches our waterways it causes pollution, algae blooms, and safety concerns. So next time you mow your lawn, rake the clippings back onto the lawn. Keep them out of ditches and gutters. And for leaves, weeds, and branches, either bag them for pick-up or put them in a compost bin.
A message from Charles County Government Watershed Protection and Restoration Program. Visit charlescountymd.gov/watershed to learn more.

Podcast Inside your County Government: When It Rains

The Media Services Division met with WPRP staff in June 2018 to record a podcast entitled *When It Rains* focusing on stormwater, pollution prevention, and water quality. The episode is part of a series of podcasts called *Inside your County Government.* The episode was released in October 2018. It is posted on the County's website and was posted on Facebook and Twitter. The podcast can be heard at the following link: http://www.buzzsprout.com/209287/827040-when-it-rains or by clicking the icon below.

Public Reporting of Water Quality Complaints

Water Quality Complaint Call-in number/Online Reporting

The County has a call-in number and an online reporting system for water quality complaints, including suspected illicit discharges, illegal dumping, and spills.

Web page content encourages citizens to call the County at **301-645-0540** during business hours and the Maryland Department of the Environment's toll-free 24-Hour emergency number for pollution problems in Maryland at **866-633-4686, or 866-MDE-GOTO** during non-business hours.

The online reporting tool can be accessed from the Charles County homepage under "How Can We Help You?"

Illicit Discharge Detection and Elimination Program (IDDE)

Public Education

The WPRP web page features information on the IDDE Program. The web page explains what IDDE is, describes Charles County's program, explains how to report an illicit discharge, and gives a link to the IDDE brochure. The brochure is distributed to citizens upon request and at outreach events. The *Excal Visual* video entitled *IDDE: A Grate Concern* ran on Charles County's TV station, CCGTV, 360 times during FY 2018.

Video: IDDE: A Grate Concern

Fiscal Year	# Runs
FY 2016	365
FY 2017	540
FY 2018	360
FY 2019	280

Septic Pump-Out Program

The Septic Pump-Out Reimbursement Program continued to be a robust and popular program in FY 2019. The program began in FY 2015 and funds the partial reimbursement of the cost for pumping property owner's septic systems. Properties within the Chesapeake Bay Critical Area (CBCA) are eligible for 75% reimbursement and properties outside the CBCA can receive a 50% reimbursement. Each property or system is eligible to participate every three years. Septic pump-outs are tracked and are counted toward meeting impervious acre restoration goals under the County's MS4 permit. The WPRP web page provides educational information about the program and the value of maintaining septic systems. Participation in the program is steady, as shown in the following table. The total dollars reimbursed through the program for FY 2019 was $107,980.20.

Fiscal Year	# of Reimbursed Pump-Outs
FY2015	832
FY2016	783
FY2017	606
FY 2018	760
FY 2019	874

In October 2018, the Charles County Commissioners passed Bill No. 2018-08 which offers property owners partial reimbursement for the installation of septic system risers on existing systems. The program utilizes the same application form as the Pump-out Program. Citizens may apply for both programs using a single form, as applicable. Reimbursement for risers is a maximum of one hundred dollars ($100) per system. Applicants must demonstrate the risers were purchased and installed by providing proof of purchase and installation by a hauler or contractor, or proof of purchase for risers independently installed. Property owners must apply within six (6) months of riser installation.

Outreach Events

Rain Barrel/Compost Workshops/Shred Event

The Department of Planning and Growth Management (PGM) and the Department of Public Works (DPW) in collaboration with the University of Maryland Extension staff team up in the spring and fall to offer workshops on rain barrels and composting and offer free shredding to citizens. The fall 2018 workshop was cancelled due to a vendor issue for the rain barrels. The spring FY 2019 workshops were well attended as shown in the following table. Various conservation brochures were made available to workshop attendees and the public.

Spring 2019 –June 1, 2019

BMP	# of Attendees
Rain Barrels – 29 barrels	41 people
Compost – 50 bins	50 people

County Fair

The County's various departments host outreach booths at the Charles County Fair annually. Outreach is conducted on recycling, litter reduction, household hazardous waste disposal, Going Green, water conservation, and stormwater pollution. WPRP staff attended on Friday, September 14, 2018 which was School Children's Day at the Fair. Staff answered questions, disseminated outreach material and encouraged environmental stewardship.

Outreach materials included brochures on illicit Discharge, household hazardous waste, recycling, water conservation and more. Stormwater demonstrations were given using the EnviroScape watershed model. Fair goers were quizzed on stormwater and watershed knowledge to earn WPRP giveaway items.

Storm Drain Stenciling/Marking Program

The WPRP Storm Drain Stenciling/Marking Program continued to grow in FY 2019. The program began in July 2017. This volunteer-based program helps raise awareness about stormwater pollution and encourages stewardship in Charles County communities. Stencil kits are available on loan from the WPRP staff. Pre-made markers and adhesive are provided to volunteers who prefer the markers. The Roads Division under the Department of Public Works is also targeting several communities with storm drain clogging issues by installing pre-made markers on all storm drains.

The WPRP has an interactive map (click here) where citizens can see which drains have been marked or stenciled and view photos. In June 2019, the location of the Town of La Plata's storm drains was added to our interactive map. The Town and the County have agreed to allow town property owners to participate in the program and utilize our resources. It's a mutually beneficial partnership to involve town residents in environmental education and outreach. Several volunteer groups participated in the Storm Drain Stenciling/Marking program.

Group Name	Group Type	Location	# of drains marked/stenciled
Tri County Youth Services	Youth/Student camp	Industrial Park Drive	2
Ms. Sinai AME Church	Grant recipient	Stonebridge	5
Deborah Beckner	Citizen Volunteer	Indian Head Estates	16
Ennika Coleman	Citizen volunteer	Williamsburg Circle	4
Charles County DPW	County Government	Various	221
			Total: 248

Chesapeake Bay Trust Grant Partnership Program

Charles County continued their partnership with the Chesapeake Bay Trust (CBT) in FY 2019 to administer grants funded by the Stormwater Remediation Fee. The Outreach and Restoration Grant program provides funds for outreach projects that raise public awareness and engage citizens about challenges and solutions to restoring natural resources, such as green spaces, parks, streams, rivers and bays. The grant program also provides funds for on-the-ground community-based restoration projects that benefit Charles County's rivers, streams, native plants, trees, and the Chesapeake Bay, as well as a combination of outreach and restoration for the maximum award of up to $75,000.

The Watershed Assistance Grant program is a smaller grant that funds the planning and design of outreach of restoration projects, as well as a combination of both. Below is an update on projects that were awarded in previous fiscal years. No new grantees were funded during FY 2019 for Charles County projects.

Outreach & Restoration Grants Status Update

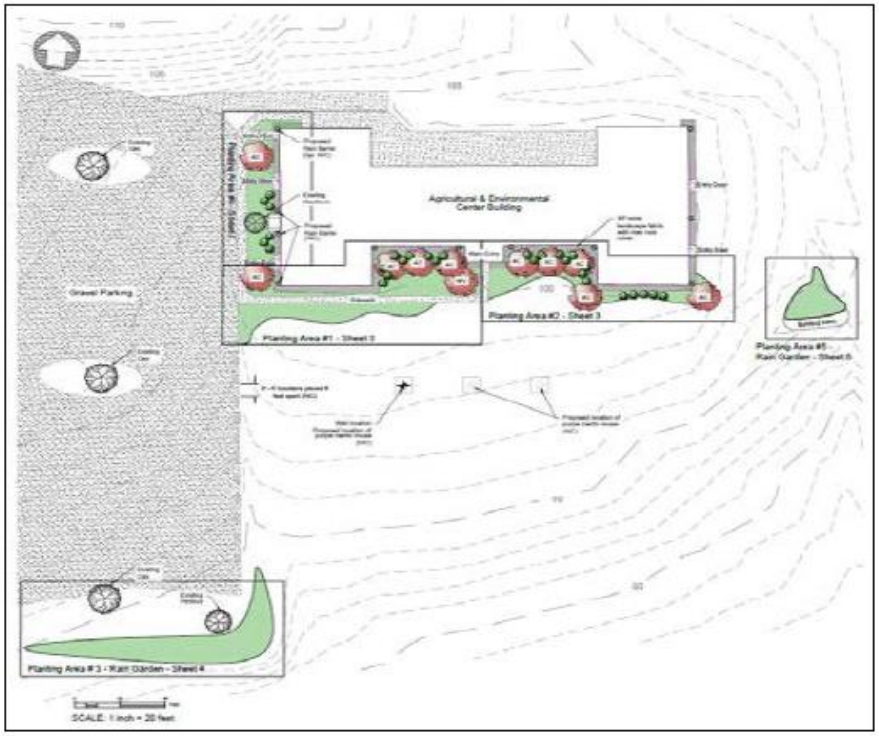
Grant Awarded in FY 2017

- *Mattawoman Watershed Society:* $3,118, Improving the Stewardship of the watershed tributaries in the Bryans Road area by developing capacity within the Mattawoman Watershed Society to launch an effective educational program for Bryan's Road residents. This grant was completed in FY 2019 by a discussion of next steps.
    - *On June 5, 2019 staff from the Chesapeake Bay Trust and the Charles County Planning Division met with a contact of the Mattawoman Watershed Society to review findings and identify potential educational program projects that could be submitted for funding in the FY 2020 grant cycle.*
    - *Project ideas included: Live underwater mussel/oyster cam of the Mattawoman Creek linked to a webpage, Watershed Stewards Academy pilot, pervious paving maintenance outreach in the Scotland Heights Community, Mason Springs Conservancy kayak launch site improvements and education, and installing conservation landscaping projects in Colonial Charles, an over 55 community.*

Grants Awarded in FY 2018

- *Charles Soil Conservation District (SCD):* $42,500, Charles County Agricultural & Environmental Service Center 2018 Best Management Practices Implementation

The Charles SCD was awarded a partial grant to implement the BMP project whose design was funded under the 2018 Watershed Assistance Grant. The project provides stormwater management on the Charles SCD property.

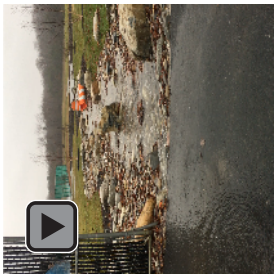


As of June 2019, the native landscaping area and rain garden have been completed and vegetation established, and the Purple Martin houses were completed and installed in time for the martins to discover them this year. Tree swallows and bluebirds are using the martin houses already.

The native plant habitats are serving as waystations, breeding grounds and/or homes to a variety of native and migrating birds, insects and butterflies including monarchs, swallowtails and a variety of bees. Over 60 species of birds were counted during the last bird count in May 2019. The grassed waterway was constructed in October 2019. The project has been highlighted to a visiting congressman and over 160 attendees at the Charles County Soil Conservation District Annual Cooperator Dinner held on May 22, 2019.

- *Port Tobacco River Conservancy:* $41,997, Dr. James Craik Elementary School Outdoor Classroom Project

  The PTRC was awarded a grant to implement outdoor classroom project which was designed prior under a 2017 Watershed Assistance Grant. The implementation included construction of stormwater amendments including a swale to manage runoff from an adjacent parking area and associated plantings. The project was completed in the Fall of 2018. A video shows the swale functioning during a rain event.



- *Mount Sinai AME Church:* $5,416, Watershed Education & Rain Garden

  The Mount Sinai African Methodist Episcopal Church received a grant to hold an educational workshop and storm drain stenciling event for youth and install a rain garden.

  The educational workshop and storm drain stenciling event have occurred. On April 17, 2019 the soil percolation test was performed at Thomas Stone High School for the installation of the rain garden. Results indicated the site had an excellent infiltration rate and is suitable for rain garden installation. A pre-construction meeting was completed June 5, 2019 at the site with school officials, the grantees and Charles County Planning Division staff.

  On September 21, 2019 excavation and planting of the rain garden was completed. After the rain garden was completed, the school maintenance department re-routed the downspouts from the adjacent shed to direct runoff from the roof to a rain barrel, and ultimately the rain garden.

Good Housekeeping/Conservation Practices Education

The County's website features web pages on many good housekeeping and conservation practices including:

a. Water conservation
b. Proper erosion and sediment control practices
c. Increasing proper disposal of household hazardous waste
d. Improving lawn care and landscape management (e.g. the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.
e. Installing a Rain Barrel
f. Installing a Rain Garden
g. Residential car care and washing
h. Proper pet waste management
i. Dumpster maintenance

These topics are covered under the web page entitled *Help Stop Water Pollution* under heading *What can I do?,* allowing Charles County residents to easily find helpful information on each topic. http://www.charlescountymd.gov/pgm/planning/watershed/help-stop-water-pollution

The County also provides information about good housekeeping and conservation practices at outreach events, through brochure dissemination and educating the public. Brochures are made available to citizens at events such as the County Fair and Rain Barrel, Shred Event, and Composting workshops.

Opportunities to safely and responsibly dispose of hazardous waste at County facilities are well advertised via the County website, news releases, and on web pages.

Charles County Government
NewsRelease

FOR IMMEDIATE RELEASE
News Release #2019-001
Wednesday, Jan. 2, 2019, 8:05 a.m.

FOR MEDIA INQUIRIES ONLY:
Donna Fuqua, Public Information Specialist
Office: 301-885-2779
Email: FuquaD@CharlesCountyMD.gov

2019 Household Hazardous Waste Collection Schedule

The Department of Public Works would like to remind citizens that the first household hazardous waste collection for 2019 will be held on Saturday, Jan. 5. The household hazardous waste collection site is located in the parking lot of the Department of Public Works building, located at 10430 Audie Lane, off of Radio Station Road in La Plata. Collection hours are 9 a.m. – 3 p.m.

Items accepted free of charge include: pesticides, herbicides, fertilizer, gasoline, oil-based paint, cleaning supplies, pool chemicals, fluorescent lights, mercury thermometers, and other poisons found in the home. Please remember to mark any container that does not have a readable, original label.

Unacceptable materials include bio-medical waste (sharps, needles, anything with bodily fluids), latex paint, prescription drugs, and ammunition. Used motor oil, anti-freeze, propane tanks, and batteries are accepted on a regular basis at various collection sites. Latex paint is **not** considered hazardous waste and can be placed in your household trash as long as it is solidified. This can be accomplished by adding kitty litter, shredded paper, paint hardener, or sawdust to aid in drying it out.

Household hazardous waste collection occurs on the first Saturday of each month. Upcoming 2019 collection dates are: Jan. 5, Feb. 2, March 2, April 6, May 4, June 1, July 6, Aug. 3, Sept. 7, Oct. 5, Nov. 2, and Dec. 7.

Register for the Citizen Notification System (CNS) to get updates on environmental resources, curbside recycling, and inclement weather delay notifications. To register for CNS, manage your message settings, provide preferred contact information, and select categories visit, www.CharlesCountyMD.gov/CNS.

The County provides the following information when requested regarding NPDES permitting requirements, pollution prevention plan development, proper housekeeping and spill prevention and response:

Maryland Wastewater Permits Program
http://www.mde.state.md.us/programs/Water/wwp/Pages/index.aspxx

Maryland Water Permit Applications
http://mde.maryland.gov/programs/Permits/WaterManagementPermits/Pages/index.aspxx

Maryland NPDES Industrial & General Surface Water Discharge Permits
http://www.mde.state.md.us/programs/Water/wwp/Pages/IndustrialSurfaceDischargePermits.aspx

Maryland Guidance for Developing Your Storm Water Pollution Prevention Plan
http://mde.maryland.gov/programs/Permits/WaterManagementPermits/Documents/Marina%20GP/16MA/16MA%20MDE%20SWPPP%20Guidance%20for%20Marinas.pdf

Maryland Stormwater Pollution Prevention Guidance
http://www.mde.maryland.gov/programs/Permits/WaterManagementPermits/WaterDischargePermi tApplications/Documents/GDP%20Stormwater/MD%20Stormwater%20Hotspots.pdf

Maryland Spill Response - Toll Free Number (866) 633-4686
http://mde.maryland.gov/programs/Crossmedia/EmergencyResponse/Pages/ERHome.aspx

IV.E. Restoration Plans and Total Maximum Daily Loads

Overview of Permit Conditions

1. Watershed Assessments

a. By the end of the permit term, Charles County shall complete detailed watershed assessments for the entire County. Watershed assessments conducted during previous permit cycles may be used to comply with the requirement provided the assessments include all of the items listed in Part IV.E.1.b. below. Assessments shall be performed at an appropriate watershed scale (e.g., Maryland's hierarchical eight- or twelve-digit sub-basins) and be based on MDE's TMDL analysis or equivalent and comparable County water quality analysis;

b. Watershed assessments by the County shall:

i. Determine current water quality conditions;
ii. Include the results of a visual watershed inspection;
iii. Identify and rank water quality problems;
iv. Prioritize all structural and nonstructural water quality improvement projects; and
v. Specify pollutant load reduction benchmarks and deadlines that demonstrate progress toward meeting all applicable stormwater WLAs.

FY 2019 Status

Watershed Assessments Summary

Charles County contracted KCI Technologies, Inc. to complete watershed assessments for each of the County's watersheds. Watershed assessments were initiated in the summer of 2014, just prior to the County's new permit term which began in December 2014 and were completed and submitted to MDE by July 2018. A single watershed, or multiple watersheds were assessed each year as shown in Table 9.

The Port Tobacco River was selected as a pilot watershed because it provided a variety of development types, including older and new development. Mattawoman Creek and Patuxent River Lower both have local approved stormwater waste load allocations (SW-WLAs) therefore they were selected for the second round of assessments in order to complete the work prior to development of the County's Bay and local SW-WLA restoration plans. Mattawoman Creek has local SW-WLA targets for total nitrogen and total phosphorus, and the Patuxent River Lower has a local SW-WLA for bacteria. Gilbert Swamp, Zekiah Swamp, and Wicomico River were selected for the third round of

assessments, and Potomac River (Upper, Middle, and Lower) and Nanjemoy Creek were completed in the final fourth round of assessments.

All plans were completed, presented at public meetings, and made available for 30-day public review and comment periods. Any comments received were addressed in revisions to the assessment reports and documented in an appendix of each report. The full assessment reports can be viewed on the Charles County Government website.

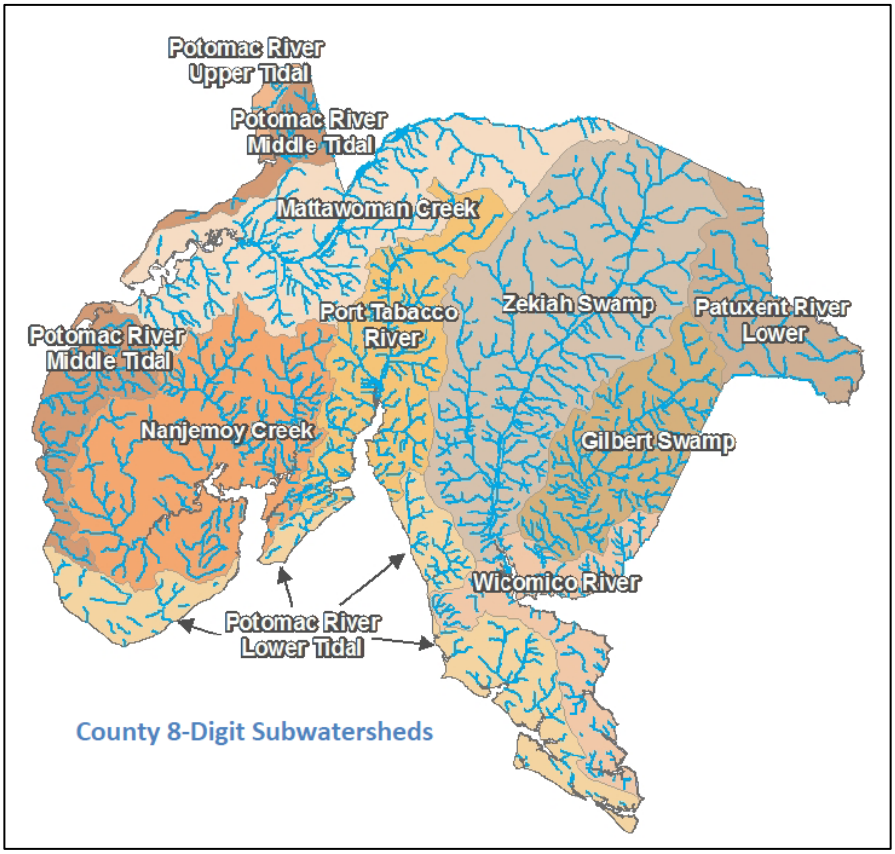


Table 9: Watershed Assessment Completion Schedule

Dates of Plan Development	Included Watersheds	Status
Summer 2014 to Summer 2015	Port Tobacco River	Completed September 2015; submitted to MDE June 2016
Spring 2015 to Summer 2016	Mattawoman Creek Patuxent River Lower	Completed June 2016; submitted to MDE June 2016
Spring 2016 to Fall 2016	Gilbert Swamp Zekiah Swamp Wicomico River	Completed May 2018; submitted to MDE July 2018
Spring 2017 to Fall 2017	Potomac River Upper Tidal Potomac River Middle Tidal Potomac River Lower Tidal Nanjemoy Creek	Completed May 2018; submitted to MDE July 2018

Watershed Assessment Methods

The goals of each of the assessments are to meet the County's permit requirements under Section III.E.1.b. Assessments document the current conditions of the watershed, identify issues, and identify and prioritize water quality improvements. The assessments include anticipated implementation costs and calculations of pollutant loading reduction and impervious surface treatment that would be expected from implementation of the recommended projects and programs.

The assessments include the following field and desktop assessments.

- Neighborhood Source Assessment
- Hotspot Site Investigations
- Nutrient Synoptic Sampling
- Stream Corridor Assessment

Results of the desktop and field watershed assessments are compiled and the results are analyzed to determine appropriate restoration measures. Structural and non-structural practices and programs suggested include:

- Stream restoration
- Shoreline erosion control
- Stormwater BMPs (swales, step pool stormwater conveyance, bioretention, wet pond)
- Reforestation
- Environmental site design
- Street sweeping
- Inlet cleaning
- Trash clean-up
- Homeowner practices (rain barrels, rain gardens, downspout disconnect)

Lastly, projects are prioritized for implementation by scoring each project on a series of metrics including project benefits, project constraints, and project costs. Each project was ranked based on the total score and a final prioritization was determined to aid the County's planning process of project implementation.

Calculated and modeled estimates of impervious surface treatment and SW-WLA (Bay and local) reductions were developed for each of the watersheds for each pollutant.

Watershed Assessment Results

The following briefly describes the findings of the completed studies.

Port Tobacco River Watershed

The Port Tobacco Watershed Assessment was completed in September of 2015. A summary of the assessment was included in the County's FY 2015 NPDES MS4 Annual Report and was attached as Appendix J.

The Port Tobacco study resulted in 15 neighborhood assessments, 26 hotspot investigations, 47 synoptic water quality sampling sites, and eight miles of stream corridor assessments in 11 separate reaches. A number of potential projects were identified including eight stream restoration projects, one shoreline erosion control project, six tree planting projects, and 13 SWM projects including dry swales, SPSC, bioretention and wet pond retrofits. These projects were combined with 15 additional projects identified through Charles County's impervious surface treatment site selection efforts, and with homeowner practices and operational programs to determine the full scope of treatment potential identified for the watershed. Cost estimates and anticipated load reductions for each project were calculated.

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Port Tobacco River Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)		
				TN	TP	TSS
Stream Restoration	$12,106,005	$15,450,641	18,769 LF	1,407.7	1,483.2	327,180.0
Shoreline Erosion Control	$753,920	$753,920	2,432 LF	182.4	165.4	333,184.0
Stormwater Management BMPs	$6,820,541	$8,657,261	28 projects	6,373.2	688.3	192,436.6
Reforestation	$904,478	$1,567,954	6 sites	310.1	19.6	2,862.0
Street Sweeping	$564	$11,273	4.6 miles	12.3	4.9	1,478.4
Inlet Cleaning	$2,990	$59,800	115 inlets	53.3	21.3	6,394.8
Trash Cleanups	$7,000	$7,000	7 sites	N/A	N/A	N/A
Homeowner Practices	$2,129,216	$2,129,216	N/A	161.4	34.3	N/A
Septic Practices	$71,500	$689,000	133 sites	0.0	0.0	0.0
Total	**$22,796,214**	**$29,326,065**	**N/A**	8,500.40	2,417.00	863,535.80

Port Tobacco River Impervious Accounting

Impervious Accounting	Port Tobacco River
Baseline Impervious Treatment	
Port Tobacco Impervious Estimate*	1,030.8 acres
Impervious Treated	384.7 acres
Impervious Treated Percent	37%
Impervious Untreated	646.1 acres
Impervious Untreated Percent	63%
Potential Impervious Treatment	
Operational Practices	7.5 acres
Septic Pump Outs	3.9 acres
Septic Upgrades	0.5 acres
Homeowner Practices	81.4 acres
Structural Practices	374.4 acres
Vista Retrofit Projects	196.2 acres
Total Potential Impervious Treatment	**663.8 acres**
Summary of Projected Progress	
Impervious Untreated	646.1 acres
Total Potential Impervious Treatment	663.8 acres
Percent of Untreated Impervious Treated (Port Tobacco Only)	**103%**

*Impervious acres include County and private lands outside the Town of LaPlata, and is based on 2011 aerial photos.

Mattawoman Creek Watershed Assessment

The Mattawoman Creek Watershed Assessment was completed in June of 2016 and submitted to MDE for their review. The full report was included as Appendix H of the FY 2016 NPDES MS4 Annual Report.

The Mattawoman study included 10 neighborhood assessments, 21 hotspot investigations, and synoptic water quality sampling at 51 sites located throughout the watershed. During the stream corridor assessment, which covered 6.3 miles of stream, field teams collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions. Following data analysis and re-visits to several sites, potential projects were identified in several categories including, five stream restoration projects, 21 tree planting projects, and 18 SWM projects including SPSC, created wetlands, bioretention, wet ponds, and infiltration basins. These newly identified project opportunities were combined with projects identified through parallel County efforts to determine the full potential of treatment identified to date.

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Mattawoman Creek Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)		
				TN	TP	TSS
Stream Restoration	$6,730,142	$8,589,540	10,037 LF	662.9	564.8	124,585.7
Stormwater Management BMPs	$27,258,837	$32,572,910	79 projects	11,519.7	2,410.6	864,212.8
Reforestation	$340,310	$589,942	21 sites	116.7	7.6	1,344.8
Street Sweeping	$27,837	$556,749	100.7 miles	1,281.0	512.4	153,720.0
Inlet Cleaning	$69,199	$1,383,984	183 inlets	93.5	37.4	11,224
Trash Cleanups	$7,000		7 sites	N/A	N/A	N/A
Homeowner Practices	$1,675,674		N/A	123.6	26.6	N/A
Septic Practices	$222,279	$370,325	199 sites	0.0	0.0	0.0
Total	**$36,331,278**	**$44,063,450**	**N/A**	13,797.4	3,559.4	1,155,087.3

Mattawoman Creek Impervious Accounting

Impervious Accounting	Mattawoman Creek
Baseline Impervious Treatment	
Impervious Estimate*	3,326.4 acres
Impervious Treated	1,157.3 acres
Impervious Treated Percent	35%
Impervious Untreated	2,169.1 acres
Impervious Untreated Percent	65%
Potential Impervious Treatment	
Operational Practices	157.1 acres
Septic Connections	7.4 acres
Septic Pump Outs	4.9 acres
Septic Upgrades	4.4 acres
Homeowner Practices	39.2 acres
Structural Practices	135.0 acres
Vista Retrofit Practices	456.4 acres
GMB Structural Practices	56.5 acres
Total Potential Impervious Treatment	**860.9 acres**
Summary of Projected Progress	
Impervious Untreated	2,169.1 acres
Total Potential Impervious Treatment	**860.9 acres**
Percent of Untreated Impervious Treated	**40%**

*Impervious acres include County and private lands outside the Town of Indian Head

Lower Patuxent River Watershed

The Lower Patuxent River assessment was completed in June of 2016 and submitted to MDE for their review. The full report was included as Appendix I of the FY 2016 NPDES MS4 Annual Report.

The Lower Patuxent assessment included 4 neighborhood assessments, 1 hotspot investigation, and synoptic water quality sampling at 14 sites located throughout the watershed. During the stream corridor assessment, which covered 1.5 miles of stream, field teams collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions. Following data analysis and re-visits to several sites, potential projects were identified in several categories including, one stream restoration projects and three SWM projects including Filterra and bioretention projects. These newly identified project opportunities were combined with projects identified through parallel County efforts including a bioretention project, two shoreline stabilization projects, one tree planting project and homeowner/operation strategies to determine the full potential of treatment identified to date.

The following tables provide cost estimates and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Lower Patuxent River Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)			
				TN	TP	TSS	Bacteria
Stream Restoration	$2,220,433	$2,833,892	3,443 LF	258.2	234.1	51,638.0	
Shoreline Erosion Control	$2,108,438	$2,530,125	3,466 LF	260.0	235.7	474,842.0	
Stormwater Management BMPs	$138,945	$164,586	3 projects	13.70	1.50	256.90	
Reforestation	$175,000	$42,905	1 sites	6	2	0.5	
Homeowner Practices	$855,914		N/A	60.8	13	N/A	
Septic Practices	$312,000	$277,130	132 sites	0.0	0.0	0.0	
Pet Waste	$5,000	Variable					30 bn MPN/day
Total	**$5,640,676**	**$5,848,638**	**N/A**	598.7	486.3	526,737.4	30 bn MPN/day

Lower Patuxent River Impervious Accounting

Impervious Accounting	Lower Patuxent River
Baseline Impervious Treatment	
Impervious Estimate	536.0 acres
Impervious Treated	207.4 acres
Impervious Treated Percent	39%
Impervious Untreated	328.6 acres
Impervious Untreated Percent	61%
Potential Impervious Treatment	
Operational Practices	0.0 acres
Septic Connections	0.0 acres
Septic Pump Outs	3.6 acres
Septic Upgrades	6.2 acres
Homeowner Practices	19.9 acres
Structural Practices	36.70 acres
Vista Retrofit Practices	0.0 acres
BayLand Structural Practices	140.6 acres
GMB Structural Practices	0.0 acres
Total Potential Impervious Treatment	**207.0 acres**
Summary of Projected Progress	
Impervious Untreated	328.6 acres
Total Potential Impervious Treatment	207.0 acres
Percent of Untreated Impervious Treated	**63%**

Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Assessments

The Gilbert Swamp, Zekiah Swamp, and Wicomico River watershed assessments were conducted Spring 2016 through Fall 2016 and the final reports were submitted to MDE in July 2018.

Field and desktop assessments were performed similarly to previous assessments. The neighborhood source assessments were conducted at 11 neighborhoods located throughout the three watersheds and a total of 20 hotspot investigations were conducted. Synoptic water quality sampling took place at 96 sites and stream corridor assessment was completed for approximately 8 miles of streams. During the stream corridor assessment, the field team collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions.

The desktop and field assessments resulted in the identification of potential restoration projects which were revisited in the field to determine feasibility. The following table presents the number and type of projects identified in each watershed.

Projects Identified During the Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Assessments

Project Type	Gilbert Swamp	Zekiah Swamp	Wicomico River
Stream restoration	5	1	1
Stormwater BMPs (includes bioretention, dry swale, SPSC)	5	7	3
Tree Plantings	3	8	1
Trash Cleanup Sites	2	6	2
Rain Barrels and Rain Gardens- # Neighborhoods	4	5	2

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Impervious Accounting

Impervious Accounting	Gilbert	Zekiah	Wicomico
Baseline Impervious Treatment*			
Total Impervious Area	998.4 acres	3,783.7 acres	387.4 acres
Impervious Treated	113.4 acres	718.7 acres	32.5 acres
Impervious Treated Percent	21%	27%	20%
Impervious Untreated	439.5 acres	1,932.3 acres	132.6 acres
Impervious Untreated Percent	79%	73%	80%
Potential Impervious Treatment			
Total Potential Impervious Treatment	**157.0 acres**	**723.2 acres**	**66.4 acres**
Summary of Projected Progress			
Impervious Untreated	439.5 acres	1,932.3 acres	132.6 acres
FY17 Progress – Impervious Treatment	9.8 acres	116.2 acres	105.9 acres
Potential Impervious Treatment	157.0 acres	723.2 acres	66.4 acres
Total Progress and Potential Treatment	166.8 acres	839.4 acres	172.3 acres
Percent of Untreated Impervious Treated	**38%**	**43%**	**130%**

*Impervious acres based on 2011 aerials photos (Vista, 2017).

Cost Estimate by Project Type and Level - Gilbert Swamp, Zekiah Swamp, and Wicomico River Watersheds

	Total Initial Cost		
Project Type	**Gilbert**	**Zekiah**	**Wicomico**
Level 9- Projects from watershed assessments	$6,167,154	$1,825,290	$3,304,133
Stream Restoration	$5,967,540	$544,380	$2,974,740
Stormwater Management	$152,514	$1,042,480	$321,893
Reforestation	$45,100	$232,430	$5,500
Trash Cleanups	$2,000	$6,000	$2,000
Level 2- In Construction as of FY 2016	$0	$0	$0

Level 3- Full Design as of FY 2016	$0	$898,320	$0
Level 5-11- Concept as of FY 2016	$3,354,000	$7,633,030	$178,758
Street Sweeping	$0	$53,743	$1,730
Inlet Cleaning	$0	$15,504	$0
Homeowner Practices	$685,180	$1,353,260	$34,504
Septic Practices	$55,089	$139,689	$90,667
Total	**$10,261,423**	**$11,020,516**	**$3,609,792**

Nanjemoy Creek and Potomac River Upper, Middle and Lower Watershed Assessments
There are no local SW-WLA assigned to Charles County for the Nanjemoy Creek or Potomac River watersheds, however these watersheds are included in the SW-WLA assigned to Charles County for the Chesapeake Bay TMDL for nutrients and sediment. The Nanjemoy Creek and Potomac River Upper, Middle, and Lower watershed assessments were conducted Spring 2017 through Fall 2017 and the final reports were submitted to MDE in July 2018.

Field and desktop assessments were performed similarly to previous assessments. The neighborhood source assessments were conducted at 19 neighborhoods located throughout the four watersheds and a total of 23 hotspot investigations were conducted. Synoptic water quality sampling took place at 97 sites and stream corridor assessment was completed for approximately 9 miles of streams. During the stream corridor assessment, the field team collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions.

The desktop and field assessments resulted in the identification of potential restoration projects which were revisited in the field to determine feasibility. The following table presents the number and type of projects identified in each watershed.

Projects Identified During the Nanjemoy Creek and Potomac River Watershed Assessments

Project Type	Nanjemoy Creek	Potomac River
Stream restoration	1	8
Stormwater BMPs (includes bioretention, dry swale, created wetland, wet pond retrofit, SPSC)	8	12
Tree Plantings	1	4
Shoreline Erosion Control	0	1
Trash Cleanup Sites	0	0
Rain Barrels and Rain Gardens- # Neighborhoods	7	12

The tables below show the impervious treatment achieved by planned strategies and present cost information associated with these planned practices.

Nanjemoy Creek and Potomac River Watershed Impervious Accounting

Impervious Accounting	Nanjemoy Creek	Potomac Lower	Potomac Middle	Potomac Upper
Baseline Impervious Treatment*				
Total Impervious Area	903.3 acres	945.2 acres	621.5 acres	48.1 acres
Impervious Treated	109.2 acres	78.5 acres	63.9 acres	5.6 acres
Impervious Treated Percent	21%	18%	22%	16%
Impervious Untreated	413.7 acres	365.3 acres	222.4 acres	29.2 acres
Impervious Untreated Percent	79%	82%	78%	84%
Potential Impervious Treatment				
Total Potential Impervious Treatment	**222.2 acres**	**82.0 acres**	**0.0 acres**	**0.0 acres**
Summary of Projected Progress				
Impervious Untreated	413.7 acres	365.3 acres	222.4 acres	29.2 acres
FY17 Progress-Impervious Treatment	95.5 acres	553.7 acres	28.2 acres	66.4 acres
Potential Impervious Treatment	222.2 acres	353.6 acres	86.0 acres	3.2 acres
Total Progress and Potential Treatment	317.7 acres	907.3 acres	114.2 acres	69.6 acres
Percent of Untreated Impervious Treated	**77%**	**100%**	**51%**	**100%**

*Impervious acres based on 2011 aerials photos (Vista, 2017).

Cost Estimate by Project Type and Level - Nanjemoy Creek and Potomac River Watersheds

	Total Initial Cost	
Project Type	**Nanjemoy**	**Potomac**
Level 9- Projects from watershed assessments	$574,270	$8,228,610
Stream Restoration	$64,500	$5,141,295
Stormwater Management	$410,770	$1,999,015
Reforestation	$99,000	$168,300
Shoreline Erosion Control	$0	$920,000
Level 2- In Construction	$0	$0
Level 3- Full Design	$0	$1,763,310
Level 5-8- Concept	$931,858	$4,807,156
Street Sweeping	$0	$5,750
Inlet Cleaning	$0	$0
Homeowner Practices	$689,848	$1,701,566
Septic Practices	$ 228,830	$691,054
Total	**$2,424,806**	**$17,197,446**

Overview of Permit Conditions

2. Restoration Plans

a. Within one year of permit issuance, Charles County shall submit an impervious surface area assessment consistent with the methods described in the MDE document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, June 2011 or subsequent versions). Upon approval by MDE, this impervious surface area assessment shall serve as the baseline for the restoration efforts required for this permit.

By the end of the permit term, Charles County shall commence and complete the implementation of restoration efforts for twenty percent of the County's impervious surface are consistent with the methodology described in the MDE document cited in Part IV.E.2.a. that has not already been restored to the MEP. Equivalent acres restored of impervious surfaces, through new retrofits or the retrofit of pre-2002 structural BMPs, shall be based upon the treatment of the WQv criteria and associated list of practices defined in the 2000 Maryland Stormwater Design Manual. For alternate BMPs, the basis for calculation of equivalent impervious acres restored is based upon the pollutant loads from forested cover.

FY 2019 Status

MDE commented on the County's impervious surface assessment in April 2016. Response to comments was sent August 1, 2016, and additional information in March and May 2017. On May 23, 2017, MDE issued tentative approval of the County's impervious area baseline. On September 26, 2018, MDE issued final approval of the County's impervious area baseline. The impervious surface assessment data is included in the enclosed MS4 Geodatabase, *Impervious Surface* table.

Following are descriptions of the County's impervious surface restoration projects, which are summarized in Table 10. They are divided into Capital Projects (denoting large scale construction projects paid by County bonds), Operational Projects (denoting annual or maintenance projects paid by the County's annual operating budget), and Grant/Private Projects (denoting private or grant funding). Construction projects are noted with a status of: complete, which means substantial completion and the start of the 1 year warranty period, under construction, or in design.

The restoration projects fall into categories of stormwater management best management practices found in MDE's Design Manual, and alternative best management practices, such as step pool storm conveyances, shoreline restoration, stream restoration, outfall stabilization, street sweeping, catch basin cleaning, tree planting, and on-site septic disposal system upgrades to nitrogen removal technology, and on-site septic disposal system connections to public sanitary sewer.

Capital Projects Complete or Under Construction

***Carrington Watershed Restoration Projects* (two shallow marshes & two wet swales):** Design began in FY 2005, and projects complete in FY 2008. (County Permit #'s VCI 060034, 060035 and 060036)

Impervious Treated: 34.73 acres

Approx. cost per acre treated: $53,764

Status: Complete (April 16, 2008)

***Bryans Road Watershed Restoration Project* (dry swale, under-ground storm filter with the community park above):** Design began in FY 2007 and project completed in FY 2013. (County Permit # VCI 090078)

Impervious Treated: 9.65 acres

Approx. cost per acre treated: $198,223

Status: Complete (May 8, 2013)

***Pinefield Watershed Restoration Project* (enlargement of existing wet pond):** Design began in FY 2009 and project completed in FY 2013. (County Permit # VCI 090111)

Impervious Treated: 22.3 acres

Approx. cost per acre treated: $48,912

Status: Complete (May 17, 2013)

***Acton Hamilton Watershed Restoration Project (*submerged gravel wetland and wetland restoration):** Design complete in January 2017 and construction began July 2017. (County Permit # VCI 120088)

Estimated Impervious Treatment: 36.85 acres

Estimated cost per acre treated: $48,458

Status: Complete (September 20, 2019)

***Temi Drive Watershed Restoration Project (*submerged gravel wetland):** Design began in FY 2013. Construction began February 2016. (County Permit # VCI 130063)

Estimated Impervious Treatment: 15.2 acres

Estimated cost per acre treated: $70,279

Status: Complete (August 15, 2017)

***Holly Tree Lane Watershed Restoration Project* (step pool storm conveyance):** Design began in FY 2012. Construction began in 2016. (County Permit # VCI 130058)

Estimated Impervious Treatment: 49.22 acres

Estimated cost per acre treated: $33,515

Status: Complete (August 4, 2017)

***Fox Run Watershed Restoration Project* (step pool storm conveyance):** Design process began in FY2012, and construction complete in FY 2015.
(County Permit # VCI 110102)

Impervious Treatment: 9.5 acres

Approx. cost per acre treated: $97,858

Status: Complete (June 8, 2015)

***Ryon Woods Watershed Restoration Project* (grass swales with check dams):**
Design began FY 2012.
(County Permit # VCI 110099)

Impervious Treatment: 0.95 acres

Approx. cost per acre treated: $128,122

Status: Complete (April 22, 2014)

***White Plains Watershed Restoration Project* (shallow gravel wetland):**
Design began in FY 2012.
Construction completed in FY 2017.
(County Permit # VCI 120067)

Estimated Impervious Treatment: 5.13 acres

Estimated cost per acre treated: $103,526

Status: Complete (January 5, 2017)

***Acton Lane Stormwater Management Facility Project* (wet pond):**
Design began in FY 2009.
Construction started in May 2014.
(County Permit # VCI 040021)

Impervious Treatment: 16.18 acres

Approx. cost per acre treated: $17,471

Status: Complete (May 6, 2015)

***Tanglewood Watershed Restoration Project* (step pool storm conveyance):**
Design began in September 2014.
Construction started December 2015.
(County Permit # VCI 150005)

Impervious Treatment: 21.32 acres

Estimated cost per acre treated: $61,708

Status: Complete (August 31, 2016)

***Potomac Heights Stormwater Management Facility Project* (wet pond and swales):**
Design began in October 2009.
Construction started in February 2015.
(County Permit # VR 120095)

Estimated Impervious Treatment: 22.12 acres

Estimated cost per acre treated: $32,233

Status: Complete (September 12, 2017)

Benedict Village Enhancements Project **(rain garden):**
Design began in July 2013.
Construction started in July 2014.
(County Permit # VCI 140021)

Impervious Treatment: 0.14 acres

Approx. cost per acre treated: $300,000

Status: Complete (September 12, 2014)

Tenth District Stormwater Management **(shallow gravel wetland/with grass swales):**
Private project. Construction started in January 2016.
(County Permit # VC 140006)

Impervious Treatment: 2.6 acres

Approx. cost per acre treated: $37,399

Status: Complete (May 18, 2017)

Charles County Plaza **(shallow gravel wetland):**
Design completed September 2016.
Construction started July 2017.
(County Permit # VCI 150024)

Impervious Treatment: 20.47 acres

Approx. cost per acre treated: $40,726

Status: Complete (October 25, 2018)

Pinefield Drainage Improvements **(Storm Drain Cleaning - removal of 2,824 tons sediment):**
Design completed November 2015.
Construction started March 2016.
(County Permit # VCI 130013)

Annual Impervious Treatment: 94 acres

Approx. cost per acre treated: $12,028

Status: Complete (October 10, 2017)

Benedict Shoreline Stabilization:
Design completed August 3, 2017.
Construction began April 2018.
(County Permit # VCI 160057)

Impervious Treatment: 22.48 acres

Approx. cost per acre treated: $38,441

Status: Complete (September 25, 2018)

Swan Point Shoreline Stabilization:
Design completed May 2017.
Construction began January 2018.
(County Permit # VCI 170008)

Impervious Treatment: 70.36 acres

Approx. cost per acre treated: $19,845

Status: Complete (October 1, 2018)

***Charles County Department of Public Works* (step pool storm conveyance):**
Design completed March 2017.
Construction began August 2018.
(Town of La Plata Permit # 0315)

Impervious Treatment: 22.18 acres

Approx. cost per acre treated: $43,435

Status: Complete (July 31, 2019)

Longmeade Lot 9 Outfall Stabilization:
Design completed December 2017.
Construction began August 2018.
(County Permit # VCI 170049)

Impervious Treatment: 1.74 acres

Approx. cost per acre treated: $55,634

Status: Complete (October 25, 2018)

Cliffton Shoreline Stabilization Phase 1&2
Design completed August 2017 Phase 1.
Design completed May 2019 Phase 2.
Construction began July 2019.
(County Permit # VCI 160056 Phase1)
(County Permit # VCI 170096 Phase2)

Impervious Treatment: 81 acres Phase 1
Impervious Treatment : 92.7 acres Phase 2

Approx. cost per acre treated: $17,503

Status: Construction Ongoing

Bensville Park Stormwater Retrofits, Outfall Stabilizations and Tree Planting
Design completed September 2018
Construction began May 2019.
(County Permit # VCI 170079)

Impervious Treatment: 13.68 acres

Approx. cost per acre treated: $54,459

Status: Construction Ongoing

General Smallwood Middle School
Design completed February 2019.
Construction began May 2019.
(County Permit # VCI 170032)

Impervious Treatment: 3.43 acres

Approx. cost per acre treated: $81,957

Status: Construction Ongoing

Apple Creek Stream Restoration
Design completed May 2019.
Construction began July 2019.
(County Permit # VCI 160055)

Impervious Treatment: 14.96 acres

Approx. cost per acre treated: $54,596,780

Status: Construction Ongoing

LaPlata High School Stormwater Retrofit
Design completed May 2018.
Construction began May 2019.
(County Permit # N/A)

Impervious Treatment: 29 acres

Approx. cost per acre treated: $27,368

Status: Construction Ongoing

St. Charles Parkway Stream Restoration
Design completed August 2019.
Construction began December 2019.
(County Permit # VCI 170053)

Impervious Treatment: 20.2 acres

Approx. cost per acre treated: $39,594

Status: Construction Ongoing

Thomas Higdon ES Stream Restoration
Design completed August 2019.
Construction began December 2019.
(County Permit # VCI 170071)

Impervious Treatment: 29.6 acres

Approx. cost per acre treated: $36,043

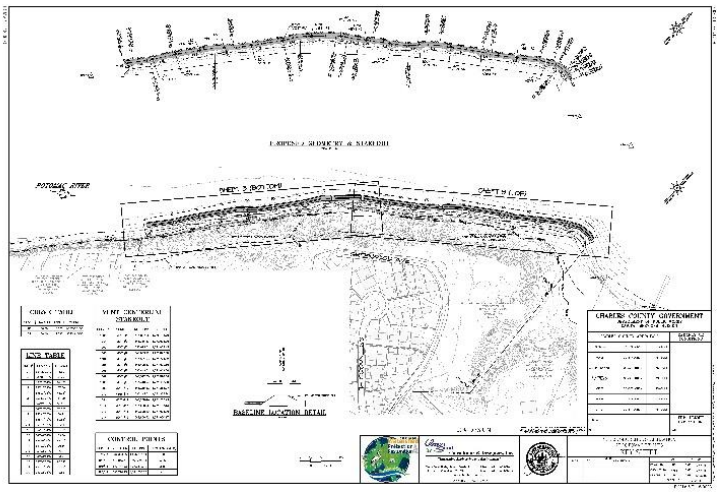
Status: Construction Ongoing

Potomac Heights Shoreline Restoration
Design completed September 2019.
Construction – TBD
(County Permit # VCI 180003)

Impervious Treatment: 70.2 acres

Approx. cost per acre treated: $20,029

Status: Construction – (Awaiting Contract)

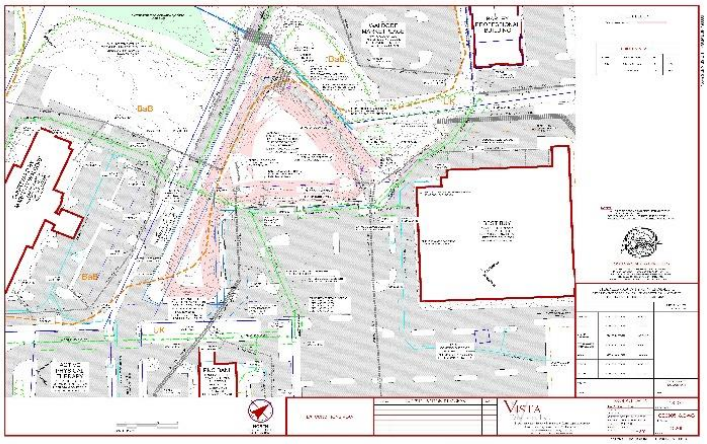


Best Buy Stormwater Pond Retrofit
Design completed April 2019.
Construction – TBD
(County Permit # VCI 190036)

Impervious Treatment: 4.62 acres

Approx. cost per acre treated: $70,455

Status: Construction – (Awaiting Contract)



Capital Projects under Design & Estimated Impervious Acres to be Treated

Shoreline Projects (Subtotal: 0 Acres)

Board of Education Projects (Subtotal: 26.97 Acres)
Lackey High School (County Permit # VCI 170031) – 6.14 Impervious Acres
JC Parks Elem/Matthew Henson Middle School (County Permit # DSP 180018) – 11.83 Impervious Acres
Milton Somers Middle School Steam Restoration (Town of LaPlata Permit) – 7 Impervious Acres
Mitchell Elementary School `Outfall Stabilization and Stream Restoration – 2 Impervious Acres

Stream Restoration Projects (Subtotal: 598.5 Acres)
Hunt Club/Bridle Path Stream (County Permit # DSP 190022) – 37.79 Impervious Acres
Marbella Stream (County Permit # TBD) – 74.28 Impervious Acres

Ruth B. Swann Main Channel (County Permit # DSP 190020)– 106.07 Impervious Acres
Ruth B. Swann Northern Channel (County Permit # DSP 190080) – 48.98 Impervious Acres
Ruth B. Swann Tributary Channel (County Permit # DSP 190051)– 34.96 Impervious Acres
CSM Tributaries (County Permit # DSP 190030) – 22.2 Impervious Acres
Oak Ridge Park Western Stream – 75.6 Impervious Acres
Oak Ridge Park Eastern Stream – 56.62 Impervious Acres
Port Tobacco Stream Upper/Lower – 110.00 Impervious Acres
Locust Grove Farm Stream – 20 Impervious Acres
Westdale Drive Stream – 12.0 Impervious Acres

Stormwater Management Facilities/ Step Pool Conveyance Projects (Subtotal: 78.44 Acres)
South Hampton Pond Retrofits & Step Pool Conveyance (County Permits # DSP 190073-76) – 17.13 Impervious Acres
White Plains Golf Course Pond Retrofit/Stream (County Permit # DSP 190097) – 32.52 Impervious Acres
White Oak Drive SWM Pond Retrofit – 15.55 Impervious Acres
Cedar Tree SWM Pond Retrofit – 3.61 Impervious Acres
Wilton Court SWM Pond Retrofit (County Permit # DSP 190034)– 9.63 Impervious Acres

Miscellaneous Projects (Subtotal: 10.5 Acres)
Waldorf Urban Redevelopment Corridor Infrastructure Improvements Study – Impervious Acres TBD
White Plains Failing Septic Connection to Sewer (Gateway Blvd. and Park Ave.) (County Permit # VCI 080048) – 10.5 Impervious Acres

Note: All impervious acres taken from the most recent engineered drawings or concepts are subject to change based on final approved engineered drawings.

Impervious Surface Restoration Summary

The following table summarizes the County's progress towards the 20% impervious restoration requirement during the permit term which began on August 1, 2007, due to the previous permit ending on July 31, 2007, and extending through December 25, 2019.

In summary, the County completed a total of 1,683.19 acres of impervious surface restoration.

Of the total: 324.11 impervious restoration acres are capital construction projects, 139.05 impervious restoration acres are annual operational programs (street sweeping, storm drain vacuuming, and septic pump-outs), 1,220.03 impervious restoration acres are permanent grant, private and County operational projects (shoreline stabilization, septic denitrification, septic connection, and outfall stabilizations).

The County also intends on nutrient trading for calendar year 2019 to supplement the restoration achieved. This is further discussed *under Part IV.E.3 Nutrient Trading*, of this annual report.

Table 10: Impervious Surface Restoration Summary (Acres)

	FY 2008-14	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Impervious Surface Area Total	5,797 (Development District)	5,797 (Development District)	9,674 (Countywide)	9,674 (Countywide)	9,674 (Countywide)	10,637 (Countywide)
Uncontrolled Acres (w/o SWM)	3,457	3,457	6,926	7,402	7,402	7,887
Controlled Acres (w/SWM)	2,250	2,250	2,748	2,272	2,272	2,750
Planned Acres for Restoration	346 (10%)	346 (10%)	1,385 (20%)	1,480 (20%)	1,480 (20%)	1,577 (20%)
Capital Restoration Projects Under Design	78.4	186.94	805.5	424.4	555.01	714.41
Capital Restoration Projects Under Construction	78.4	43.62	111.82	132.3	162.28	320.06
Completed Capital Restoration Projects	67.64	25.83	0	29.05	86.54	115.05
Completed Operational Annual Restoration Projects & Annual Avg.	Not tracked	119.4	131.69	107.22	195.4	141.54
		119.4	125.55	119.44	138.43	139.05
Completed Grant/Private/Operational Permanent Restoration Projects	884.21	24.85	121.2	111.41	62.95	15.41
Completed in Reporting Year	N/A	170.08	246.75	259.90	287.92	269.51
Total Acres Restored in Permit Term	**951.85**	**1,121.93**	**1,249.28**	**1,383.63**	**1,552.11**	**1,683.19**

Notes:

(1) The Impervious Surface Area Total is based on impervious surface from 2011 aerial photos.

(2) The Impervious Surface Area Total changed between permits. Through mid FY 2015 permit coverage applied to the Development District only, then in December 2014 coverage expanded to the entire County. The revised impervious surface was then prepared and submitted to MDE in FY 2016, which MDE tentatively approved in FY 2017 with subtractions for BMPs not inspected or with missing information.

(3) The Impervious Acres Total does not include impervious surface on federal, state, town, or

industrial stormwater permit properties. It does include County Government and Public School owned properties in towns.

(4) In July 2016, the downspout disconnect credit (428 acres) was added to the Controlled Acres.

(5) The Total Acres Restored includes the period prior to the current permit being issued, because under the previous permit the county was required to start restoration of 10% of the uncontrolled acres, but not complete any restoration.

(6) Annual operational restoration projects are based on averages over the permit period.

(7) In Sept 2018 (FY 2019), MDE revised the baseline based to add in properties less than 5 acres with industrial permits and BMPs built during Eras 2, 3, or 4 without an up-to-date triennial inspection. Additionally, 33 acres of parcel remnants in La Plata designated County Eras 1 and 3. These updates are itemized in the Executive summary Response to Comments and will be reflected in the FY 2019 NPDES Annual Report.

The above data is on the enclosed MS4 Geodatabase, in the *Impervious Surface Table*.

2. Restoration Plans

b. Within one year of permit issuance, Charles County shall submit to MDE for approval a restoration plan for each stormwater WLA approved by EPA prior to the effective date of the permit. The County shall submit restoration plans for subsequent TMDL WLAs within one year of EPA approval. Upon approval by MDE, these restoration plans will be enforceable under this permit. As part of the restoration plans, Charles County shall:

i. Include the final date for meeting applicable WLAs and a detailed schedule for implementing all structural and nonstructural water quality projects, enhanced stormwater management programs, and alternative stormwater control initiatives necessary for meeting applicable WLAs;

ii. Provide detailed cost estimates for individual projects, programs, controls, and plan implementation;

iii. Evaluate and track the implementation of restoration plans through monitoring or modeling to document progress toward meeting established benchmarks, deadlines, and stormwater WLAs; and

iv. Develop an ongoing, iterative process that continuously implements structural and nonstructural restoration projects, program enhancements, new and additional programs, and alternative BMPs where EPA approved TMDL stormwater WLAs are not being met according to the benchmarks and deadlines established as part of the County's watershed assessments.

FY 2019 Status

To address this requirement, Charles County developed the *Charles County Municipal Stormwater Restoration Plan,* which was submitted to MDE in June 2016 and includes the following:

- Demonstrates ways to meet the Total Maximum Daily Load (TMDL) Stormwater Wasteload Allocations (SW-WLAs) approved by U.S. Environmental Protection Agency
- Illustrates a strategy to provide additional stormwater runoff management on impervious acres equal to 20% of the impervious area for which runoff is not currently managed to the Maximum Extent Practicable (MEP)
- Educates and involves residents, businesses, and stakeholders in achieving measurable water quality improvements
- Establishes a reporting framework for annual reporting under the County's MS4 permit
- Provides an evaluation and adaptive management process for developing actions to be taken if permit requirements are not met
- Identifies the funding needed to implement the Restoration Plan

MDE provided comments on the Restoration Plan on June 21, 2017. These comments, along with updates based on public review and comment were addressed and the Plan was resubmitted with the Annual Report in December 2017. MDE provided comments on the Stormwater Wasteload Allocation (SW-WLA) Revised Implementation Plan on November 28, 2018. These comments were addressed in the FY 2018 Annual Report.

Charles County's final approved local TMDLs with SW-WLAs include the following:

- Mattawoman Creek – Nutrients: Nitrogen and Phosphorus
  - 0214011 – Mattawoman Creek
- Mattawoman Creek – PCBs – No County responsibility
  - 0214011 – Mattawoman Creek
- Lower Patuxent River (shellfish harvesting areas) – Fecal Coliform Bacteria
  - 021311010887 – Indian Creek
- Tidal Potomac River – PCBs (Polychlorinated Biphenyls) – No County responsibility
  - 02140201 – Upper Potomac River
  - 02140102 – Middle Potomac River
  - 02140101 – Lower Potomac River
- Patuxent River Lower – Sediment
  - 02131101 – Patuxent River Lower
- Port Tobacco River – Sediment
  - 02140109 – Port Tobacco River

The Restoration Plan presents the projects and programs to be implemented by Charles County to meet the NPDES MS4 requirements for local TMDL SW-WLAs in the Mattawoman Creek and Lower Patuxent River watersheds, and restoration goals for the Chesapeake Bay TMDL and impervious surface treatment.

Target reductions for the Chesapeake Bay, Mattawoman Creek, and Lower Patuxent TMDLs are summarized in the following table.

Table 11: Target Percent Load Reductions from the Stormwater Sector at Edge of Stream (EOS)

	Total Nitrogen EOS (lbs/yr)	Total Phosphorus EOS (lbs/yr)	Total Susp. Solids EOS (lbs/yr)	Bacteria (bn MPN/day)
Mattawoman Reductions from 2000 Baseline	54%	47%		
Lower Patuxent Reductions from 2001 Baseline				43.94%
Port Tobacco Reductions from 2009 Baseline			34%	
Chesapeake Bay Reductions from 2010 Baseline	20.24%	38.26%		

The Tidal Potomac River PCB TMDL reduction does not include a requirement for Charles County to address and therefore a restoration for PCBs is not developed (see the TMDL compliance section below for more detail).

The Patuxent River Lower Sediment TMDL was not addressed in the Restoration Plan because the TMDL was approved on July 2, 2018, after the completion of the Restoration Plan. Charles County began working on the Restoration Plan in early 2019 when it was discovered that historic biological data indicated that streams within the Patuxent River Lower watershed were in good condition and a Restoration Plan was possibly unnecessary. Communication with MDE was initiated, and a sampling plan was developed for the County to re-sample the six previously sampled MBSS sites. In spring and summer of 2019, the County completed MBSS sampling of benthic macroinvertebrate and fish communities, respectively, and found that the sites remained in good biological condition. The County and MDE are currently discussing requirements for the creation of an Attainment Plan in lieu of the Restoration Plan.

A final TMDL for PCBs in the Mattawoman Creek watershed was approved by EPA on February 19, 2019. Upon review of the TMDL it was confirmed with MDE that Charles County does not have a responsibility for the TMDL attainment and is not required to develop a TMDL implementation plan. The 5% reduction given to the Piscataway and Mattawoman tidal segments for NPDES regulated stormwater were done to provide a margin of safety. Further, the 5% reduction is expected to be achieved from a 93% reduction in atmospheric deposition.

A TMDL was approved by EPA on October 11, 2019 for the Port Tobacco for sediment. Charles County is required to submit a Restoration Plan for this TMDL by October 11, 2020, within one year of its approval. The County initiated the development of an implementation plan in December 2019 and will submit the plan to MDE prior to the due date in 2020.

Baseline and permit loads were re-calculated after the completion of the initial 2016 version of the Restoration Plan for the FY 2017 Annual Report with updated BMP data. Baseline, permit loads, and FY 2019 progress loads, are presented in *Part IV.E.5. TMDL Compliance* of this annual report.

The revised Charles County Municipal Stormwater Restoration Plan, dated December 7, 2017 is included in Appendix E of the FY 2017 NPDES Annual Report, and posted on the Watershed Protection and Restoration Program webpage:
http://www.charlescountymd.gov/sites/default/files/pgm/planning/Watershed

3. Nutrient Trading

Charles County may acquire total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) credits, in accordance with the requirements of the Maryland Water Quality Trading and Offset Program, COMAR 26.08.11, to meet its 20 percent impervious surface area restoration requirement in this permit. The basis for an equivalent impervious acre restored through trading is the difference in pollutant loads between urban and forest stormwater runoff according to MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, 2014, or the most recent version). On an annual basis, until reissuance of this permit, the permittee shall report to MDE:

a. The cumulative impervious acres restored achieved through the installation of BMPs during the permit compliance period;
b. The equivalent impervious acres restored achieved through credit acquisition during the permit compliance period; and
c. Documentation required to verify credits acquired and to be used for impervious surface restoration during the permit compliance period.

FY 2019 Status

A description of BMPs implemented during the permit term is found in *Part IV.E.2.a. Restoration Plans*, of this annual report. Additionally, the County intends on executing a Credit Acquisition Request for total nitrogen, total phosphorus and total suspended solids credits, once the credit generation period ends on December 31, 2019 and the credits are certified and registered with the Maryland Department of the Environment. A letter dated December 23, 2019 further describes this intention and has been submitted under separate cover to the Maryland Department of the Environment.

4. Public Participation

Charles County shall provide continual outreach to the public regarding the development of its watershed assessments and restoration plans. Additionally, the County shall allow for public participation in the TMDL process, solicit input, and incorporate any relevant ideas and program improvements that can aid in achieving TMDLs and water quality standards. Charles County shall provide:

a. Notice in a local newspaper and the County's website outlining how the public may obtain information on the development of watershed assessments and stormwater watershed restoration plans and opportunities for comment;
b. Procedures for providing copies of watershed assessments and stormwater watershed restoration plans to interested parties upon request;

c. *A minimum 30-day comment period before finalizing watershed assessments and stormwater watershed restoration plans; and*
d. *A summary in each annual report of how the County addressed or will address any material comment received from the public.*

FY 2019 Status

During the permit compliance period Charles County incorporated public review and comment into all ten of its watershed assessments and its stormwater restoration plan. This was done by officially publishing Public Notices in the Maryland Independent Newspaper to establish public meeting dates and thirty-day comment periods for each. Additional advertisement included News Releases, Facebook, Twitter and web ads on the Charles County Homepage with links to the draft documents.

The public meetings and presentations were held at the Charles County Government Building in La Plata, Maryland followed by question and answer sessions and 30-day public review periods. The comments received are listed along with the County's response in the Appendix of each document.

The watershed assessments are posted on the County's website at: http://www.charlescountymd.gov/pgm/planning/watershed/watershed-assessments.

The stormwater restoration plan is posted on the County's website at: https://www.charlescountymd.gov/pgm/planning/watershed/watershed-tmdl-total-maximum-daily-load-restoration-plan.

5. TMDL Compliance

Charles County shall evaluate and document its progress toward meeting all applicable stormwater WLAs included in EPA approved TMDLs. An annual TMDL assessment report with tables shall be submitted to MDE. This assessment shall include complete descriptions of the analytical methodology used to evaluate the effectiveness of the County's restoration plans and how these plans are working toward achieving compliance with EPA approved TMDLs. Charles County shall further provide:

a. *Estimated net change in pollutant load reductions from all completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives;*
b. *A comparison of the net change in pollutant load reductions detailed above with the established benchmarks, deadlines, and applicable stormwater WLA's; and*
c. *Itemized costs for completed projects, programs, and initiatives to meet established pollutant reduction benchmarks and deadlines;*

d. Cost estimates for completing all projects, programs, and alternatives necessary for meeting applicable stormwater WLAs; and

e. A description of a plan for implementing additional watershed restoration actions that can be enforced when benchmarks, deadlines, and applicable stormwater WLAs are not being met or when projected funding is inadequate.

FY 2019 Status

Baseline loads, permit loads, and FY 2019 progress loads, are presented below for the Chesapeake Bay TMDL and local TMDLs. The information is also included in the MS4 Geodatabase *Local Stormwater Watershed Assessment* and *Countywide Stormwater Watershed Assessment* tables.

Chesapeake Bay TMDL

Chesapeake Bay TMDL loads are presented here for informational purposes only, as Charles County's stormwater sector is required by its MS4 NPDES permit to meet the Bay TMDL requirements by completion of the 20% impervious surface restoration. The impervious surface restoration is required to be met by the end of the County's permit term in December of 2019, and the Bay TMDL is required to be met by 2025. Refer to *Part IV.E.2.a. Restoration Plans* of this annual report (previous section) for more information on impervious surface restoration.

Countywide Bay TMDL baseline and permit loads have been re-calculated at the end of FY 2017 with updated BMP data that would impact the baseline and permit loads. These loads have not changed with FY 2018 or FY 2019 updates. Bay TMDL loads were calculated using MAST using BMP data from the County's stormwater Geodatabase and data from the County's street sweeping and inlet cleaning programs. Countywide 2010 baseline loads were modeled in MAST with "2010 revised" land use conditions and included all BMPs with a built date prior to and including 6/30/2010. Target loads were calculated by multiplying the Bay TMDL target reduction percent with the Countywide modeled baseline pollutant load for each pollutant to first calculate a calibrated reduction target. This reduction target was then subtracted from the baseline load to calculate the target load (i.e., WLA). Permit loads were modeled in MAST using "2010 revised" land use conditions and included all BMPs with a built date prior to and including 12/30/2014 (Charles County's permit issuance date). A spreadsheet model was used to determine FY 2019 Current loads since MAST is no longer available. BMP load reductions were calculated using MAST "2010 revised" loading rates and removal efficiencies from *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* (2014) and CBP Expert Panel reports which are generally consistent with MAST and Bay Model version 5.3.2.

FY 2019 Current load includes BMPs with a built date prior to and including 6/30/2019. Load reductions from other practices (street sweeping, inlet cleaning), were summed with stormwater

BMP reductions, and then subtracted from baseline loads to calculate current loads.

Countywide Bay TMDL loads are reported in DEL (delivered) lbs/yr to align with the Bay TMDL. Table 17 presents the baseline loads and target loads, as well as current loads, which include BMPs implemented between the baseline year and FY 2019. **Error! Reference source not found.**Table 18 and Table 19 present the Countywide BMP implementation through FY 2019. Refer to Charles County's Financial Assurance Plan (FAP), submitted with this Annual Report, for specific cost information associated with these projects.

Table 12: Countywide Chesapeake Bay TMDL Loads & Reductions, Baseline through FY 2019

	Nitrogen (DEL lbs/yr)	Phosphorus (DEL lbs/yr)	Sediment (DEL lbs/yr)
Baseline Load (2010 Baseline Year)	177,107.66	17,423.97	5,987,538.15
Target Percent Reduction	20.24%	38.26%	-
Target Load	141,261.07	10,757.56	-
Permit Load	174,642.71	16,892.78	4,914,367.85
FY 2019 Current Load	158,411.37	12,456.68	(201,199.25)
FY 2019 Current Load Reduction	18,696.29	4,967.29	6,188,737.40
FY 2019 Percent Reduction	10.56%	28.51%	103.36%
Reduction Remaining for Treatment	17,150.30	1,699.12	-

Table 13: Countywide BMP Implementation, Baseline through FY 2019

BMP Type	# Practices	Length (feet)	Drainage Area (Acres)	Impervious Area (Acres)
Mattawoman Creek				
Dry Swale	1	n/a	2.75	1.42
Enhanced Filter	1	n/a	459.70	8.92
Open Channel	1	n/a	106.67	20.44
SPSC	3	n/a	173.68	80.05
Submerged Gravel Wetland	2	n/a	75.72	35.67
Wet Pond	3	n/a	108.10	40.2
Impervious Surface Reduction*	25	n/a	0.25	0.25
Zekiah Swamp				
Grass Swale	1	n/a	3.85	0.95
Shallow Marsh	2	n/a	114.25	33.63
Submerged Gravel Wetland	1	n/a	192.50	5.13
Wet Swale	2	n/a	135.97	1.10
Impervious Surface Reduction*	21	n/a	0.21	0.21
Nanjemoy Creek				
Submerged Gravel Wetland	1	n/a	5.57	2.60
Impervious Surface Reduction*	9	n/a	0.09	0.09
Shoreline Stabilization	10	8,385	n/a	n/a

Patuxent River Lower				
Bioretention/Rain Garden	1	n/a	0.18	0.14
Impervious Surface Reduction*	4	n/a	0.04	0.04
Shoreline Stabilization	2	682	n/a	n/a
Port Tobacco				
Impervious Surface Reduction*	15	n/a	0.15	0.15
Shoreline Stabilization	1	569	n/a	n/a
Wicomico River				
Impervious Surface Reduction*	7	n/a	0.07	0.07
Shoreline Stabilization	11	3,206	n/a	n/a
Potomac River Lower Tidal				
Impervious Surface Reduction*	11	n/a	0.11	0.11
Shoreline Stabilization	86	21,712	n/a	n/a
Potomac River Middle Tidal				
Impervious Surface Reduction*	2	n/a	0.02	0.02
Shoreline Stabilization	1	1,755	n/a	n/a
Potomac River Upper Tidal				
Impervious Surface Reduction*	1	n/a	0.01	0.01
Shoreline Stabilization	2	1,590	n/a	n/a
Gilbert Swamp				
Impervious Surface Reduction*	4	n/a	0.04	0.04

*Includes homeowner Fee Credit practices, including Rain Barrels, Bay-Wise Certified, and Disconnection of Runoff

Table 14: Countywide Street Sweeping and Inlet Cleaning Pounds Removed FY 2019

Practice	Pounds Removed
Street Sweeping	341,778.99
Inlet Cleaning	231,781.79

Local TMDLs

Mattawoman Creek local TMDL nitrogen and phosphorus loads were modeled in a combination of BayFAST, MAST, and a spreadsheet approach. Baseline loads were first calibrated in BayFAST by creating a facility boundary to determine the loading rates from the Charles County portion of Mattawoman Creek. In order for consistency in land use source used for pollutant load modeling, the land use acres provided in the delineated BayFAST facility were replaced with MAST County Phase I/II MS4 impervious and pervious acres for the baseline year (i.e., 2000). BMPs with a built date prior to and including 6/30/2000 were entered into the BayFAST baseline model to calculate 2000 nitrogen and phosphorus loads. Target loads for the Mattawoman Creek local TMDL were calculated by multiplying the local TMDL target reduction percent with the BayFAST baseline loads to first calculate a calibrated reduction target. This reduction target was then subtracted from the

baseline load modeled in BayFAST. Permit loads were calculated in BAYFAST using the baseline land-use facility and includes BMPs with a built date prior to and including 12/30/2014 (Charles County's permit issuance date). Since the BAYFAST tool is no longer available for use, current loads were calculated with MAST and a spreadsheet approach. FY 2019 loads were calculated using a spreadsheet approach since MAST is no longer available. BMP load reductions were calculated using MAST "2010 revised" loading rates and removal efficiencies from *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* (2014) and CBP Expert Panel reports which are generally consistent with MAST and Bay Model version 5.3.2. Load reductions associated with BMPs with a built date prior to and including 6/30/2019 were included. Load reductions from other practices (street sweeping, inlet cleaning, and septic practices), were summed with stormwater BMP reductions, and then subtracted from baseline loads to calculate current loads.

Charles County has set a Mattawoman Creek local TMDL completion date of 2035. Local TMDL loads and load reductions are reported in EOS lbs/yr and are presented in Table 20. FY 2019 Progress includes BMPs installed between the baseline year (2000) and FY 2010. Mattawoman Creek BMP implementation through FY 2019 is presented in Table 21. Refer to Charles County's Financial Assurance Plan (FAP), submitted with this Annual Report, for specific cost information associated with these projects.

Charles County has several projects currently under construction, in design, and planned for the Mattawoman Creek watershed, including two bioretention, two bioswale/grass swales, one sheetflow to conservation, one sand filter, fourteen tree plantings, seven stream restorations, and seven wet pond/wetlands. In addition, septic system practices and street sweeping are slated to continue in the watershed. Table 20 presents the loads and load reductions associated with these projects through FY 2025. Additional projects will be needed to meet the target load by 2035. Projects identified in the Restoration Plan in addition to projects identified since the completion of the plan will be prioritized in the coming years to continue progress towards meeting the goal.

Table 15: Mattawoman Creek Watershed TMDL Loads and Reductions

	Nitrogen (EOS lbs/yr)	Phosphorus (EOS lbs/yr)
Baseline and Targets		
Baseline Load (2000 Baseline Year)	56,492.80	4,963.20
Target Percent Reduction	54%	47%
Target Load	25,986.69	2,630.50
Calibrated Reduction	30,506.11	2,332.70
Permit Load	53,462.24	4,677.71
FY 2019 Progress		
FY 2019 Current Load	51,596.19	4,487.87
FY 2019 Current Load Reduction	4,896.61	475.33
FY 2019 Percent Reduction	8.7%	9.6%
Reduction Remaining for Treatment	25,609.50	1,857.37

Planned FY 2020-FY 2025		
FY 2020-FY 2025 Planned Reduction	5,253.22	1,186.28
Total Reductions		
Reduction (Progress + Planned)	10,149.83	1,661.61
Total Percent Reduction	18%	33%
Reduction Remaining for Treatment	15,836.86	968.89

Table 16: Mattawoman Creek BMP Implementation, Baseline through FY 2019

BMP Type	# Practices	Drainage Area (Acres)	Impervious Area (Acres)	Pounds Removed
Mattawoman Creek				
Dry Swale	1	2.75	0.73	n/a
Enhanced Filter	1	459.70	8.92	n/a
Open Channel	1	106.67	20.44	n/a
SPSC	3	173.68	80.05	n/a
Submerged Gravel Wetland	2	75.72	35.67	n/a
Wet Pond	3	108.10	40.20	n/a
Impervious Surface Reduction*	25	0.25	0.25	n/a
Septic Practices	572	n/a	n/a	n/a
Street Sweeping/Inlet Cleaning**	n/a	n/a	n/a	254,657.53

*Includes homeowner Fee Credit practices, including Rain Barrels, Bay-Wise Certified, and Disconnection of Runoff

**Street sweeping and inlet cleaning are annual practices; pounds presented are from FY 2019 only.

Indian Creek local TMDL bacteria loads were calculated using a spreadsheet approach based on the Watershed Treatment Model and are presented in bn MPN/day in Table 22. FY 2019 Progress includes BMPs installed between the baseline year (2001) and FY 2019, and includes 11 septic denitrification projects, resulting in a total load reduction of 352 bn MPN/day and percent reduction of 11.6%. Planned practices include 31 septic upgrades and a pet waste education program. Refer to the Charles County Municipal Stormwater Restoration Plan for details and to the Financial Assurance Plan (FAP), submitted with this Annual Report, for specific cost information associated with these projects. The Indian Creek local TMDL is scheduled to be met by 2025.

Table 17: Indian Creek Watershed TMDL Loads and Reductions

	Bacteria (bn MPN/day)
Baseline and Target	
Baseline Load (2001 Baseline Year)	3,038
Target Percent Reduction	43.94%
Target Load	1,703
Permit Load	2,974

FY 2019 Progress	
FY 2019 Current Load	2,686
FY 2019 Current Load Reduction	352
FY 2019 Percent Reduction	11.59%
Reduction Remaining for Treatment	983
Planned FY 2020-FY 2025	
FY 2020-FY2025 Planned Reduction	990
Total Reductions	
Reduction (Progress + Planned)	1,342
Total Percent Reduction	44.17%
Reduction Remaining for Treatment	0

Charles County is included in the TMDL for polychlorinated biphenyl (PCBs) in the Potomac River Lower Tidal, Middle Tidal, and Upper Tidal. The percent reduction for these TMDLs in Charles County is 5% and is due to the margin of safety (MOS) built into the TMDL calculation. According to the TMDLs, 5% MOS reduction is expected to be achieved through the proposed 93% reduction in atmospheric deposition; therefore, reduction strategies from the stormwater sector of Charles County are not necessary to meet the overall TMDLs. These TMDLs are not addressed further in the County's Restoration Plan.

A final TMDL for PCBs in the Mattawoman Creek watershed was approved by EPA on February 19, 2019. Upon review of the TMDL it was confirmed with MDE that Charles County does not have a responsibility for the TMDL attainment and is not required to develop a TMDL implementation plan. The 5% reduction given to the Piscataway and Mattawoman tidal segments for NPDES regulated stormwater were done to provide a margin of safety. Further, the 5% reduction is expected to be achieved from a 93% reduction in atmospheric deposition.

A TMDL was approved by EPA on October 11, 2019 for the Port Tobacco for sediment. Charles County is required to submit a Restoration Plan for this TMDL by October 11, 2020, within one year of its approval. The County initiated the development of an implementation plan in December 2019 and will submit the plan to MDE prior to the due date.

Charles County plans on using the Phase 6 Chesapeake Bay Watershed Model for Fiscal Year 2020 modeling. The County will be migrating to CAST (Chesapeake Assessment and Scenario Tool), an online version of the Phase 6 Chesapeake Bay Watershed Model. It is anticipated that the baseline, target, permit and current progress loads will all change with implementation of the Phase 6 modeling.

IV.F. Assessment of Controls

Overview of Permit Conditions

1. Watershed Restoration Assessment

The County shall continue monitoring in the Mattawoman Creek watershed, or select and submit for MDE's approval a new watershed restoration project for monitoring. Monitoring activities shall occur where the cumulative effects of watershed restoration activities can be assessed. One outfall and an associated in-stream station, or other locations based on study design approved by MDE, shall be monitored. The minimum criteria for chemical, biological, and physical monitoring are as follows:

a. Chemical Monitoring:

i. Eight (8) storm events shall be monitored per year at each monitoring location with at least two occurring per quarter. Quarters shall be based on calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month at the monitoring stations if flow is observed;

ii. Discrete samples of stormwater flow shall be collected at the monitoring stations using automated or manual sampling methods. Measurements of pH and water temperatures shall be taken;

iii. At least three (3) samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to methods listed under 40 CFR Part 136 and event mean concentrations (EMC) shall be calculated for:

Biochemical Oxygen Demand (BOD_5)	*Total Lead*	*Hardness*
Total Kjeldahl Nitrogen (TKN)	*Total Copper*	
Nitrate plus Nitrite	*Total Zinc*	
Total Suspended Solids	*Total Phosphorus*	
Total Petroleum Hydrocarbons (TPH)	*E. coli or enterococcus*	

iv. Continuous flow measurements shall be recorded at the in-stream monitoring station or other practical locations based on the approved study design. Data collected shall be used to estimate annual and seasonal pollutant loads and reductions, and for the calibration of watershed assessment models. Pollutant load estimates shall be reported according to any EPA approved TMDL with a stormwater WLA.

FY 2019 Status

For the 2019 reporting year, Charles County continued the long-term chemical monitoring program in the Acton-Hamilton watershed. The monitoring period for this reporting year extended from July 2017 through June 2019.

In the fall and winter of 2013, Charles County began the process of selecting a new chemical monitoring site. The location selected is in the Acton-Hamilton watershed, within the County's Development District. The proposed site is located downstream of several proposed water quality retrofits to be built over the next several years. In March 2014, MDE met with the County at the proposed chemical monitoring station. MDE proposed that the County wait on moving the Arthur Middleton Elementary School site to the Acton-Hamilton site until further study could be performed to ensure the magnitude of proposed water quality projects would be large enough to show a water quality difference. Based on guidance from MDE to delay the relocation of the sampling stations, sampling resumed at Arthur Middleton Elementary School in July 2014.

In response to MDE's request for further study, Vista Design, Inc. produced a report titled *Acton-Hamilton Watershed NPDES Watershed Restoration Concept Study* in August 2014, which includes an analysis of the treated and untreated impervious area within the Acton-Hamilton watershed and all of the proposed stormwater retrofit improvements. Based on this report, the Acton-Hamilton study area is approximately 730 acres of which 243.23 acres are impervious surfaces. A determination in the report was made that 98.72 acres of the 243.23 acres are considered to be "treated". Of the remaining 144.6 acres of "untreated" or "undertreated" impervious surfaces, several proposed stormwater facilities and retrofits to existing stormwater facilities are planned. These include a large offline submerged gravel wetland and wetland along the main stem channel, thirteen pond retrofits, and the addition of four submerged gravel wetlands and Filterra treatment systems. After implementation is complete, the total proposed "treated" impervious surfaces area will be 187.03 acres which represents 77% of all the impervious surfaces in the study area.

In February and March 2015, site selection for the proposed upstream and downstream in-stream stations began in the Acton-Hamilton Watershed. Station locations were field visited and selected based on stream channel characteristics, access to stream channel, and proximity to all of the proposed water quality retrofits and enhancement projects. In April 2015, two instream stations were established within the unnamed tributary to Piney Run. The upstream site (AH001) is located just downstream of a large culvert near the intersection of US 301 and Business Park Road. The downstream site (AH002) is located just upstream of the culvert under Hamilton Road and just below the existing in-stream Acton-Hamilton Geomorphic Study Reach along Timberbrook Drive.

Chemical wet-weather monitoring began at AH001 and AH002 on April 25, 2015 and has continued twice per quarter. Final MDE approval for moving the Arthur Middleton Elementary School site to the Acton-Hamilton site was received by the County in July 2015.

The goal of sampling storms during the 2015-2019 reporting years was to determine a baseline in water quality before construction occurs within the watershed. The construction on the large offline submerged gravel wetland and wetland along the main stem channel between Timberbrook Drive and Shearwater Drive began in early 2018 and was completed September 2019. The construction activities for the installation of these facilities may have impacted sampling results for the 2019 reporting year. An assessment of the functionality of these facilities will be summarized in the 2020 reporting year.

Acton-Hamilton Chemical Monitoring

For the 2019 reporting year, chemical monitoring was performed at two instream stations on a tributary to Piney Run within the Acton Hamilton watershed that were established in April 2015. Site AH001 is located just downstream of a large culvert near the intersection of US 301 and Business Park Road. Site AH002 is located just upstream of the culvert under Hamilton Road and just below the existing in-stream Acton-Hamilton Geomorphic Study Reach along Timberbrook Drive.

The location of each station was selected based on its proximity to future water quality improvements within the Acton-Hamilton watershed. The sites were established prior to construction of the water quality projects to develop a pre-retrofit baseline for pollutant inflow to the receiving channel.

An In-Situ level logger and staff plate were installed at each station on June 18, 2015. Prior to installation, flow depth was measured at a surveyed cross-section at each station to determine the discharge from a rating table. This method was used for the 2015, 2016, 2017, 2018 and 2019 reporting years.

Eight storms were sampled at the Acton-Hamilton sites during the 2019 reporting year. Storm event samples were collected on 8/21/2018, 10/11/2018, 10/26/2018, 11/2/2018, 1/24/2019, 3/1/2019, 6/11/2019, and 6/13/2019.

The monitoring protocols included three discrete samples, representative of the rising limb, peak, and falling limb of the storm hydrograph for each storm event, collected at each monitoring station. All samples were collected manually so that E. coli and TPH could also be analyzed. Martel Laboratories in Towson, Maryland performed the laboratory analysis for each event. Due to the duration of some storm events and the proximity of the sites to the laboratory, some of the discrete E. coli samples were delivered to laboratory after the method holding time for both sites.

Table 18: Number of Samples for Chemical Monitoring at the Acton-Hamilton Stations

		Wet Weather Sample		Baseflow Sample	
Year	**Month**	**AH001**	**AH002**	**AH001**	**AH002**
2015	April	1	1	1	1
	June	2	2	-	-
	September	1	1	-	-
	October	1	1	-	-
	November	2	2	-	-
2016	January	1	1	-	-
	April	1	1	-	-
	May	1	1	-	-
	June	1	1	-	-
2017	March	1	1	-	-
	April	1	1	-	-
	May	2	2	-	-
	August	1	1	-	-
	September	1	1	-	-
	October	2	2	-	-
2018	March	2	2	-	-
	April	1	1	-	-
	July	-	-	1	1
	August	1	1	-	-
	October	2	2	-	-
	November	1	1	-	-
2019	January	1	1	-	-
	March	1	1	-	-
	June	2	2	-	-

No rising limb sample was taken at either site for the 8/21/2018 storm event. The stream had already begun to rise upon crew arrival. The hydrographs at site AH002 for the 3/1/2019 storm event shows that the falling limb sample was taken early in the falling limb and may instead represent the peak. This sample was not used for the calculation of the event, quarter, or annual weighted mean concentrations.

The combined Acton-Hamilton results from the chemical monitoring for the current reporting year are contained in the County's geodatabase.

The combined Acton-Hamilton results from the chemical monitoring for this reporting year are contained in the *Chemical Monitoring Table* of the enclosed MS4 geodatabase and Appendix E.

Acton-Hamilton Event Mean Concentrations

Using the modeled stage-discharge relationship for each station and the laboratory results for each discrete sample collected at the sites, event mean concentrations (EMCs) were computed. EMCs were weighted based on the volume of flow for each limb of the storm. Volume was calculated using each station's level logger data and a modeled stage-discharge rating curve. The chemical concentrations were multiplied by the flow volume, summed and divided by the total flow volume to compute a weighted average for each storm event. The EMCs for the 8/21/2018 storm event for both sites were weighted without the rising limb samples and flow volumes and the EMCs for the 3/1/2019 storm event for the AH002 site were weighted without the falling limb sample and flow volume.

If a parameter was not detected in the laboratory analysis, a value of zero was used for the low end of the possible range, and the detection limit was used for the high end of the range. The flow-weighted EMCs for each storm were then averaged to determine the average EMC for each parameter at each site. Average flow-weighted EMCs by calendar year for the Acton-Hamilton sites (AH001 and AH002) are provided in Tables 19 and 20.

Table 19: Annual Average Flow-Weighted EMC and Number of Events Sampled, AH001

FY	TKN	NO_x	TP	TSS	BOD	Pb	Cu	Zn	TPH	E-coli	Hardness
	mg/L Event					ug/L Event			mg/L Event	MPN Event	ug/L Event
*2014/15 Report**	*1.01 3*	*0.27 3*	*0.18 3*	*81 3*	*15.51 3*	*6.01 3*	*12.92 3*	*106.96 3*	*5.1 3*	*11,787 3*	*31,307 3*
2014/15 Revised	0.783	0.203	0.163	683	7.083	5.123	10.343	82.443	1.13	21,730 3	26,434 3
2015/16	0.928	0.258	0.158	558	4.798	1.838	9.618	71.048	0.98	10,092 8	30,787 8
2016/17	1.528	0.348	0.158	748	4.868	4.288	11.038	71.198	3.26 8	7,507 8	33,882 8
2017/18	0.357	0.227	0.117	417	2.747	1.637	8.627	58.97	1.2 7	3,310 7	32,962 7
2018/19	0.368	0.308	0.148	368	2.378	2.248	7.868	63.158	2.8 8	78,846 8	24,587 8
	mg/L Event										
NURP	2.35	0.960	0.47	140.0	11.0	0.180	0.050	0.180			

**Values are the average of the three storm events individual EMC values during the 2015 reporting year and do not factor in seasonal calculations. The revised row above uses the same seasonal calculation as used in the 2016 reporting year for comparison analysis.*

Table 20: Annual Average Flow-Weighted EMC and Number of Events Sampled, AH002

FY	TKN	NO_x	TP	TSS	BOD	Pb	Cu	Zn	TPH	E-coli	Hardness
	mg/L Event					ug/L Event			mg/L Event	MPN Event	ug/L Event
2014/15 Report*	1.103	0.273	0.183	813	15.513	6.013	12.923	106.963	5.13	11,7873	31,3073
2014/15 Revised	1.143	0.833	0.353	2093	7.523	7.113	8.163	78.613	4.13	15,1173	28,9373
2015/16	0.848	0.318	0.208	598	4.928	1.688	5.188	58.318	0.38	9,5118	33,4298
2016/17	1.528	0.348	0.158	748	4.868	4.288	11.038	71.198	3.268	7,5078	33,8828
2017/18	0.357	0.297	0.167	737	1.957	2.797	4.817	39.597	1.17	3,9157	26,8037
2018/19	0.488	0.428	0.218	1828	2.258	5.238	4.008	44.898	3.48	42,0748	22,3588
	mg/L Event										
NURP	2.35	0.960	0.47	140.0	11.0	0.180	0.050	0.180			

**Values are the average of the three storm events individual EMC values during the 2015 reporting year and do not factor in seasonal calculations. The revised row above uses the same seasonal calculation as used in the 2016 reporting year for comparison analysis.*

Chemical Monitoring Assessment

The results of the laboratory analysis (both individual samples and EMCs) were reviewed for the storm events during the permit period. Findings are summarized below:

AH001 – Upstream Site

- A first flush effect was observed for the sampling station. Concentrations were typically higher in rising limb samples than for the peak samples except for phosphorus and *E. coli*, which did not show a prominent trend.
- The 11/2/2018 storm event had comparatively high concentrations of BOD, TSS (Total Suspended Solids), copper, lead, and zinc in the rising limb sample.
- The 6/11/2019 storm event had a comparatively elevated concentration of TPH in the rising limb sample.
- The 8/21/2019 storm event had a comparatively high concentration of BOD in the peak sample.
- The 10/11/2019 storm event had a comparatively high concentration of *E. coli* in the peak sample.
- Overall, the AH001 site samples contained higher concentrations of copper and zinc compared to the AH002 site samples.

- The eight-hour holding time for *E. coli* was exceeded for all 1/24/2019 samples, the 6/11/2019 rising and peak samples, and the 6/13/2019 rising limb sample.
- The 48-hour holding time for BOD was exceeded for all 11/2/2018 samples.

AH002 – Downstream Site

- A first flush effect was not as pronounced for this sampling station. A good portion of peak samples tended to be higher than rising limb sample concentrations.
- The 8/21/2018 storm event had comparatively high TSS, lead, and copper concentrations in the peak sample.
- The 10/11/2018 storm event had comparatively elevated TKN (Total Kjeldahl Nitrogen), phosphorus, and zinc concentrations in the rising limb sample and a comparatively high concentration of TPH in the falling limb sample. This storm event had higher concentrations of *E. coli* compared to the other storm events.
- The 11/2/2018 storm event had comparatively high BOD concentrations in the peak sample.
- The eight-hour holding time for *E. coli* was exceeded for all 1/24/2019 samples, the 6/11/2019 and 6/13/2019 rising limb samples.
- The 48-hour holding time for BOD was exceeded for all 11/2/2018 samples.

Federal and State acute and chronic criteria are presented in Table 21 below. The laboratory data are compared, where possible, to these criteria to assess the extent of possible pollution within this watershed. Criteria are used to protect against both short-term and long-term effects. Numeric criteria are important where the cause of toxicity is known or for protection against pollutants with potential human health impacts or bioaccumulation potential. Narrative criteria can be the basis for limiting toxicity in discharges where a specific pollutant can be identified as contributing to the toxicity.

Criteria do not exist for all parameters measured at the monitoring stations. In addition, a clear cause and effect relationship between water quality and ecological condition is difficult to determine. However, these comparisons can be used as general indicators of water quality impairment. Both State and Federal criteria are based on ambient stream conditions. Chronic criteria consider the maximum levels at which aquatic life can survive if continuously subjected to a pollutant concentration. Acute criteria reflect the maximum level at which an aquatic organism can survive if periodically subjected to a pollutant concentration. Since storm events represent a periodic condition, wet-weather samples are compared only to acute criterion.

Table 21: State and Federal Water Quality Criteria Available for Parameters Sampled

Parameter (mg/L, except as noted)	Chronic	Acute	Reference
Lead (µg/L)	2.5	65	COMAR 26.08.02.03-2
Copper (µg/L)	9	13	COMAR 26.08.02.03-2
Zinc (µg/L)	120	120	COMAR 26.08.02.03-2
Total P	0.10		1972 305(a) Report to Congress (EPA 440/9-74-001)
BOD5	7		Quality Criteria for Water, EPA 1986
Nitrate	10		Quality Criteria for Water, EPA 1986
TSS	500		1972 305(a) Report to Congress (EPA 440/9-74-001)
TKN	None		---
TPH	None		---
E. Coli(1) (MPN/100ml)	235		COMAR 26.08.02.03-3
Hardness	None		---

(1): Used most restrictive standard as a conservative approach: frequent full body contact recreation criterion.

The results of the laboratory analysis (both individual samples and EMCs) for the 2019 reporting year were compared to the values reported in Table 21 as well as the Nationwide Urban Runoff Project (NURP) values reported in Tables 19 and 20. Findings are summarized below:

AH001 – Upstream Site

- All individual samples and EMC's for BOD were below reported State and Federal water quality values except in the 11/2/2018 rising limb sample.
- All individual samples and EMC's for nitrate were below reported State and Federal water quality criteria values.
- Individual samples were above reported State and Federal water quality criteria values for total phosphorus in the 8/21/2018 peak sample, 10/11/2018 rising limb, peak, and falling limb samples, 10/26/2018 peak sample, 11/2/2018 rising limb and peak samples, and 1/24/2019 peak sample. EMC's for total phosphorus were above reported State and Federal water quality criteria values for the 8/21/2018, 10/11/2018, 11/2/2018, and 1/24/2019 storm events. The average annual EMC value for total phosphorus were slightly above the reported State and Federal water quality criteria value.
- All individual samples and EMC's for TSS were below reported State and Federal water quality criteria values except in the 11/2/2018 rising limb sample.

- Individual samples were above reported State and Federal water quality chronic criteria values for lead in the 8/21/2018 peak and falling limb samples, 10/11/2018 rising limb sample, 11/2/2018 rising limb and peak samples, 1/24/2019 peak and falling limb samples, 3/1/2019 rising limb and peak samples, 6/11/2019 rising limb and peak samples, and 6/13/2019 rising limb sample. EMC's for lead were above reported chronic State and Federal water quality criteria values for the 8/21/2018, 11/2/2018, 1/24/2019, and 6/11/2019 storm events. However, the average annual EMC value for lead was slightly below the reported chronic State and Federal water quality criteria value. The 8/21/2018 storm event samples were evaluated with a detection limit of 5 µg/L which is above the chronic State and Federal water quality criteria value. Therefore, it is unknown if the falling limb sample with <5 µg/L of lead are truly below the water quality criteria value.
- Individual samples were above reported State and Federal water quality chronic criteria values for copper in the 8/21/2018 peak sample, 10/11/2018 falling limb sample, 11/2/2018 rising limb and peak samples, 1/24/2019 rising limb and peak samples, 3/1/2019 rising limb sample, and 6/11/2019 peak sample. EMC's for copper were above reported chronic State and Federal water quality criteria values for the 8/21/2018 and 1/24/2019 storm events. However, the average annual EMC value for copper was below the reported chronic State and Federal water quality criteria value.
- All individual samples and EMC's for zinc were below reported chronic State and Federal water quality values except in the 8/21/2018 peak sample and 11/2/2018 rising limb sample.
- All individual samples and EMC's for *E. coli* were above reported State and Federal water quality criteria values except in the 3/1/2019 rising limb sample.
- All annual average EMCs in Table 2 for the sampling period were below literature values from the Nationwide Urban Runoff Project (NURP) taken in the early 1980s. Individual values for TSS and zinc in the 11/2/2018 storm rising limb sample were above literature values from NURP.

AH002 – Downstream Site

- All individual samples and EMC's for BOD were below reported State and Federal water quality values except in the 10/11/2018 rising limb sample and 11/2/2018 peak sample.
- All individual samples and EMC's for nitrate were below reported State and Federal water quality criteria values.
- All Individual samples were above reported State and Federal water quality criteria values for total phosphorus except in the 10/26/2018 falling limb sample, 1/24/2019 rising limb and falling limb samples, 3/1/2019 rising limb and peak samples, and 6/11/2019 falling limb sample. EMC's for total phosphorus were above reported State and Federal water quality criteria values for all storm events except the 3/1/2019 and 6/11/2019 storm events. The average annual EMC value for total phosphorus was above the reported State and Federal water quality criteria value.

- All individual samples and EMC's for TSS were below reported State and Federal water quality criteria values except in the 8/21/2018 peak sample.
- Individual samples were above reported State and Federal water quality chronic criteria values for lead in the 8/21/2018 peak and falling limb samples, 10/11/2018 rising limb, peak, and falling limb samples, 10/26/2018 rising limb and peak samples, 11/2/2018 rising limb, peak, and falling limb samples, 1/24/2019 peak sample, and 6/13/2019 rising limb and peak samples. EMC's for lead were above reported chronic State and Federal water quality criteria values for all storm events except the 3/1/2019 and 6/11/2019 storm events. The average annual EMC value for lead was above the reported chronic State and Federal water quality criteria value.
- All individual samples and EMC's for copper were below reported chronic State and Federal water quality values except in the 8/21/2018 peak sample, 10/11/2018 rising limb sample, and 11/2/2018 peak sample.
- All individual samples and EMC's for zinc were below reported chronic State and Federal water quality values except in the 10/11/2018 rising limb sample.
- All individual samples and EMC's for *E. coli* were above reported State and Federal water quality criteria values except in the 3/1/2019 storm rising limb sample.
- All annual average EMCs in Table 3 for the sampling period were below literature values from the Nationwide Urban Runoff Project (NURP) taken in the early 1980s except for TSS. The TKN value in the 10/11/2018 rising limb sample, the nitrate and nitrite value in the 10/26/2018 rising limb sample, the total phosphorus values in the 10/11/2018, 10/26/2018, and 6/13/2019 rising limb samples, the TSS values in the 8/21/2018 peak sample, 10/11/2018 rising limb and peak samples, 11/2/2018 rising limb and peak samples, and 6/13/2019 rising limb sample, and the BOD value in the 11/2/2018 peak sample were above literature values from NURP.

For each site, the average seasonal (quarterly) flow-weighted average was computed to determine if trends over the course of the sampling year could be witnessed. Findings are summarized below:

- Nitrate and nitrite concentrations were lower in the cooler months at the AH001 sites.
- TKN increased from spring to winter at both sites.
- Total phosphorus, TSS, and lead were high in the summer and fall quarters at the AH002 site. This was likely caused by construction activity at the upstream submerged gravel wetland and in-stream wetland facilities.
- BOD, total phosphorus, lead, copper, and zinc did not show trends throughout the year at both sites.
- TPH was present at both sites in all quarters but not all storm events.
- At both stations, *E. coli* concentrations were low in the winter quarter.
- At both stations, hardness increased from summer to spring.

Acton-Hamilton Comparison between AH001 and AH002

Overall, when comparing 2016 reporting year to 2019 reporting year data in Tables 2 and 3, the following trends were observed. BOD and hardness have decreased at the two sites over the past four years. TKN was much lower at the two sites for reporting year 2018 and 2019 than in the other reporting years. Nitrate and nitrate, phosphorus, copper, and zinc have been consistent over the past four years. TSS has also been consistent except for the significant increase at the AH002 site, likely caused by caused by construction activity for the 2019 reporting year. Lead and TPH show no trend. *E. coli* was decreasing at both sites for the past three years but significantly increased during the 2019 reporting year. At this time, the goal of the sampling is to assess the conditions present within the Acton-Hamilton watershed before water quality projects are implemented. Once the water quality projects have been implemented, analysis of storm results will determine if these projects are significantly reducing sampled pollutants within the watershed.

For the 2019 reporting year, site AH001 was found to have higher annual averages for copper and zinc but lower annual averages for total phosphorus than site AH002. These trends are consistent with previous years and may be partly explained by the spatial location of each station. The upstream monitoring site (AH001) is located just below a large area of commercialization along US 301 that would typically produce heavy metals and hydrocarbons associated with vehicles. The downstream monitoring site (AH002) is surrounded by residential neighborhoods which may be contributing more nutrients from lawn care. The AH002 site also has a much larger drainage area than the upstream site (AH001), which may be producing a dilution effect for the heavy metals.

b. *Biological Monitoring:*

i. *Benthic macroinvertebrate samples shall be gathered each Spring between the outfall and in-stream stations or other practical locations based on an approved study design; and*

ii. *The County shall use the EPA Rapid Bioassessment Protocols (RBP), Maryland Biological Stream Survey (MBSS), or other similar method approved by MDE.*

c. *Physical Monitoring:*

i. *A geomorphologic stream assessment shall be conducted between the outfall and in-stream monitoring locations or in a reasonable area based on the approved study design. This assessment shall include an annual comparison of permanently monumented stream channel cross-sections and the stream profile;*

ii. A stream habitat assessment shall be conducted using techniques defined by the EPA's RBP, MBSS, or other similar method approved by MDE; and

iii. A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

d. Annual Data Submittal: The County shall describe in detail its monitoring activities for the previous year and include the following:

i. EMCs submitted on MDE's long-term monitoring database as specified in Part V below;

ii. Chemical, biological, and physical monitoring results and a combined analysis for the approved monitoring locations; and

iii. Any requests and accompanying justifications for proposed modifications to the monitoring program.

FY 2019 Status

Biological and Physical Stream Assessments

Beginning in Fall 2005, a study site has been monitored for biological and physical condition on a tributary to Mattawoman Creek. This section summarizes data collected by KCI and Coastal Resources in the spring of 2016. The study site is located in northern Charles County between Berry Road and Acton Lane just off Timberbrook Lane. This site was previously identified as part of Charles County's Watershed Restoration Plan and was termed Acton-Hamilton based on the two major roads in the area. The Acton-Hamilton site was ranked as the fifth highest priority for restoration and was therefore selected for further investigation. The Acton-Hamilton long-term site was monitored to establish baseline values in the fall of 2005 (geomorphic assessment) and the spring of 2006 (bioassessment). The following table lists the field assessment dates including the baseline assessments.

Table 22: Field Assessment Dates

Year	Geomorphic Assessment	Biological
2005-2006	December 14, 2005	April 17, 2006
2006-2007	January 11, 2007	May 4, 2007
2007-2008	December 12, 2007	April 17, 2008
2008-2009	December 15, 2008	April 29, 2009
2009-2010	December 1, 2009	March 08, 2010
2011	April 26, 2011	April 26, 2011
2012	-	April 27, 2012

2013	March 8, 2013	March 8, 2013
2014	April 16, 2014	April 16, 2014
2015	March 16, 2015	March 16, 2015
2016	March 16, 2016	March 16, 2016
2017	March 24, 2017	March 24, 2017
2018	March 13, 2018	March 13, 2018
2019	March 29, 2019	March 29, 2019

The geomorphic assessment includes cross-sections, longitudinal profiles, and particle size analysis. Spring bioassessment monitoring involves the collection of water quality data, sampling, and analysis of the benthic macroinvertebrate community, assessment of physical and habitat features and photo-documentation of site conditions at monitoring stations on the study reach.

Geomorphic Assessment

The channel substrate along the assessment reach is dominated by medium and coarse gravels. There are two cross-sections located within the approximately 400-foot profile. At Cross Section 1, a combination of deepening of the channel due to headward migration of the pool and erosion of the left bank have caused the cross sectional area to increase over the monitoring period but has since stabilized from 2018 to 2019. The low bench on the right bank has remained nearly the same throughout the monitoring period. At Cross Section 2, erosion and about a half-foot of downcutting has occurred between 2011 and 2013. Additional downcutting occurred most years since then. In 2019, the cross sectional area at Cross Section 2 had decreased due to aggradation across the stream bed. There has been minor erosion present on the bottom of both banks in most years, but the upper banks remain stable.

Tables 23 and 24 below summarize the cross section, profile, and pebble count data for baseline and subsequent monitoring efforts. Changes in bankfull areas for the two cross sections are primarily due to erosion and aggradation associated with typical stream processes. Full results, including graphical depictions of the profile, cross sections, and pebble count data, are included in full Annual Monitoring Report, found in Appendix F. In general, the substrate is highly mobile with point bar formations, areas of channel aggradation and some finer sedimentation in the pools. The channel geometry remains consistent with previous years, with the exception of a lowered grade downstream of station 1+77 that was first evident in 2013. The stream appears to experience overbank flow in the floodprone zone regularly.

Table 23: Bankfull Channel Dimensions – Cross Section 1

Parameter	2005 0+48.5	2006 0+49.7	2007 0+49	2008 0+50	2009 0+51	2011 0+46	2013 0+46	2014 0+47	2015 0+46.5	2016 0+46.5	2017 0+46.5	2018 0+47	2019 0+46.7
Top of Bank Cross section Area (ft^2)	49.2	53.1	54.0	55.1	53.9	54.5	52.3	52.2	55.4	57.9	57.0	58.2	61.5
Bankfull Cross section Area (ft^2)	24.1	23.5	24.3	23.8	26.2	28.1	28.4	28.4	31.2	33.8	32.8	33.8	33.5
Top of Bank Width (ft)	32.3	34.7	34.8	34.9	32.4	33.5	30.5	28.3	29.3	30.6	29.8	29.5	31.0
Bankfull Width (ft)	20.9	22.3	21.6	19.7	20.8	20.1	22.1	22.2	22.3	22.5	22.6	23.1	22.8
Mean Depth (ft)	1.2	1.1	1.1	1.2	1.3	1.4	1.3	1.3	1.4	1.5	1.5	1.5	1.5
Width-depth Ratio	18.2	21.1	19.2	16.3	16.5	14.3	17.1	17.4	15.9	14.9	15.5	15.8	15.5
Velocity (ft/s) at Bankfull	3.8	3.5	3.0	3.2	3.3	3.8	3.8	3.8	3.9	4.0	4.2	4.0	4.0
Discharge Rate (cfs) at	92.5	82.9	73.0	76.1	85.9	107.2	106.9	107.4	121.5	133.6	137.7	134.0	133.4
Entrenchment Ratio	2.4	1.8	2.3	2.5	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2
D50 Particle Size (mm)	14	16	18	19	23	20	17	19	18	21	25	21	12
D84 Particle Size (mm)	28	33	29	30	39	44	25	40	41	37	42	46	28
Threshold Grain Size at Bankfull (mm)	15	15	10	12	14	18	17	19	19	20	20	19	15
Channel Slope (%)	0.49	0.49	0.31	0.34	0.4	0.47	0.48	0.54	0.49	0.52	0.53	0.49	0.38

Table 24: Bankfull Channel Dimensions – Cross Section 2

Parameter	2005 3+14	2006 3+12	2007 3+14	2008 3+21	2009 3+15	2011 3+09	2013 3+09	2014 3+05	2015 3+05	2016 3+05	2017 3+11	2018 3+15	2019 3+13
Top of Bank Cross section Area (ft^2)	28.6	27.1	27.6	29.6	29.8	32.5	32.6	35.5	35.4	33.8	34.4	41.0	38.9
Bankfull Cross section Area (ft^2)	18.5	17.0	18.1	18.2	18.1	18.9	23.1	23.9	26.6	25.3	25.6	32.0	30.1
Top of Bank Width (ft)	19.5	19.6	19.5	19.7	19.9	21.8	19.4	19.2	19.6	18.9	19.3	19.4	19.4
Bankfull Width (ft)	15.0	14.7	14.8	14.3	15	14.9	14.3	14.5	14.5	14.7	14.9	15.6	15.4
Mean Depth (ft)	1.2	1.2	1.2	1.3	1.2	1.3	1.6	1.7	1.8	1.7	1.7	2.0	1.9
Width-depth Ratio	12.2	12.6	12.0	11.3	12.5	11.8	8.9	8.8	7.9	8.5	8.6	7.6	7.9
Velocity (ft/s) at Bankfull	4.0	3.6	3.1	3.3	3.1	3.3	4.2	4.0	4.5	4.0	4.6	4.8	4.6
Discharge Rate (cfs) at Bankfull	73.3	61.4	57.1	59.2	55.2	61.8	97.0	96.8	119.1	102.3	117.9	153.2	137.4
Entrench - ment Ratio	2.7	2.4	3.0	3.1	2.2	2.3	2.5	2.5	2.5	2.4	2.4	2.3	2.3
D50 Particle Size (mm)	14	16	18	19	23	20	17	19	18	21	25	21	12
D84 Particle Size (mm)	28	33	29	30	39	44	25	40	41	37	42	46	28
Threshold Grain Size at	17	16	11	11	13	17	20	21	24	22	24	26	19
Channel Slope (%)	0.49	0.49	0.31	0.50	0.4	0.47	0.47	0.47	0.49	0.52	0.53	0.49	0.38

Instream Water Quality and Bioassessment

Table 25 summarizes the water quality, habitat, and bioassessment data. Instream water quality was measured during the bioassessment conducted in the spring of 2019. All regulated parameters fell within acceptable *COMAR* ranges. The physical habitat assessment rated the habitat for fish and benthic macroinvertebrates at the upper range of marginal. The banks were

somewhat unstable (marginal) with sub-optimal vegetative protection. The left bank had sub-optimal riparian vegetative zone width while the width on the right bank was optimal. The PHI rating has consistently remained "Partially Degraded" since the baseline monitoring. The BIBI score rated as "Poor" in 2019, with a score of 2.43. This is a decrease from the first year it was monitored in 2006. It is the third lowest score in all the years of monitoring, which ranged from "Very Poor" to "Good." Excessive algae were noted during the 2007-2010 monitoring events and were present again in 2015 through 2017. While stringy algae were present again in 2018 and 2019, it was not in excessive amounts and may have been washed away in storm events.

Table 25: Acton-Hamilton Instream Water Quality and Habitat Assessment Data

Instream Water Quality							Habitat and Biological Assessment	
Year/Time	**pH**	**DO (mg/L)**	**Temp (°C)**	**Conductivity µS/cm**	**TDS (mg/L)**	**Turbidity (NTUs)**	**PHI**	**BIBI**
Spring 2006 11:00 AM	7.04	9.09	13.19	214.2	137.0	14.9	74 (partially degraded)	3.6 (Fair)
Spring 2007 8:30 AM	7.13	3.62	13.20	214.0	139.0	4.3	74 (partially degraded)	2.7 (Poor)
Spring 2008 7:00 PM	6.85	11.17	15.79	186.0	121.3	2.6	71 (partially degraded)	3.0 (Fair)
Spring 2009 11:00 AM	6.73	6.97	16.33	236.9	n/a	3.49	78 (partially degraded)	2.7 (Poor)
Spring 2010 8:30 AM	7.76	13.52	4.50	395.7	n/a	4.16	72 (partially degraded)	2.7 (Poor)
Spring 2011 8:30 AM	6.19	8.82	18.27	174.3	n/a	8.62	73 (partially degraded)	2.4 (Poor)
Spring 2012 8:30 AM	6.23	8.75	12.17	171.5	n/a	6.62	74 (partially degraded)	2.1 (Poor)
Spring 2013 8:00 AM	6.57	13.13	4.17	185.3	n/a	12.70	77 (partially degraded)	1.9 (Very Poor)
Spring 2014 7:00 AM	7.19	10.52	8.50	304.5	n/a	22.40	77 (partially degraded)	2.7 (Poor)

Instream Water Quality							Habitat and Biological Assessment	
Year/Time	**pH**	**DO (mg/L)**	**Temp (°C)**	**Conductivity µS/cm**	**TDS (mg/L)**	**Turbidity (NTUs)**	**PHI**	**BIBI**
Spring 2015 8:30 AM	6.60	11.90	5.33	587.0	n/a	10.13	76 (partially degraded)	3.0 (Fair)
Spring 2016 8:30 AM	7.38	11.99	9.78	368.7	n/a	6.90	77 (partially degraded)	3.29 (Fair)
Spring 2017 8:30 AM	6.70	12.67	5.13	293.3	n/a	1.60	82 (minimally degraded)	2.71 (Poor)
Spring 2018 9:00 AM	6.65	12.70	3.27	296.7	n/a	1.60	80.3 (partially degraded)	4.14 (Good)
Spring 2019 9:00 AM	6.80	10.73	9.40	214.7	n/a	3.43	66.4 (partially degraded)	2.43 (Poor)
COMAR Limits	6.5 - 8.5	> 5.0	< 32.0	n/a	n/a	< 150	n/a	n/a

2. Stormwater Management Assessment

The County shall continue monitoring Piney branch watershed, or select and submit for MDE's approval a new watershed restoration project for determining the effectiveness of stormwater management practices for stream channel protection. Physical stream monitoring protocols shall include:

a. *An annual stream profile and survey of permanently monumented cross-sections in the unnamed tributary to Piney Branch to evaluate channel stability;*

b. *A comparison of the annual stream profile and survey of the permanently monumented cross-sections with baseline conditions for assessing areas of aggradation and degradation; and*

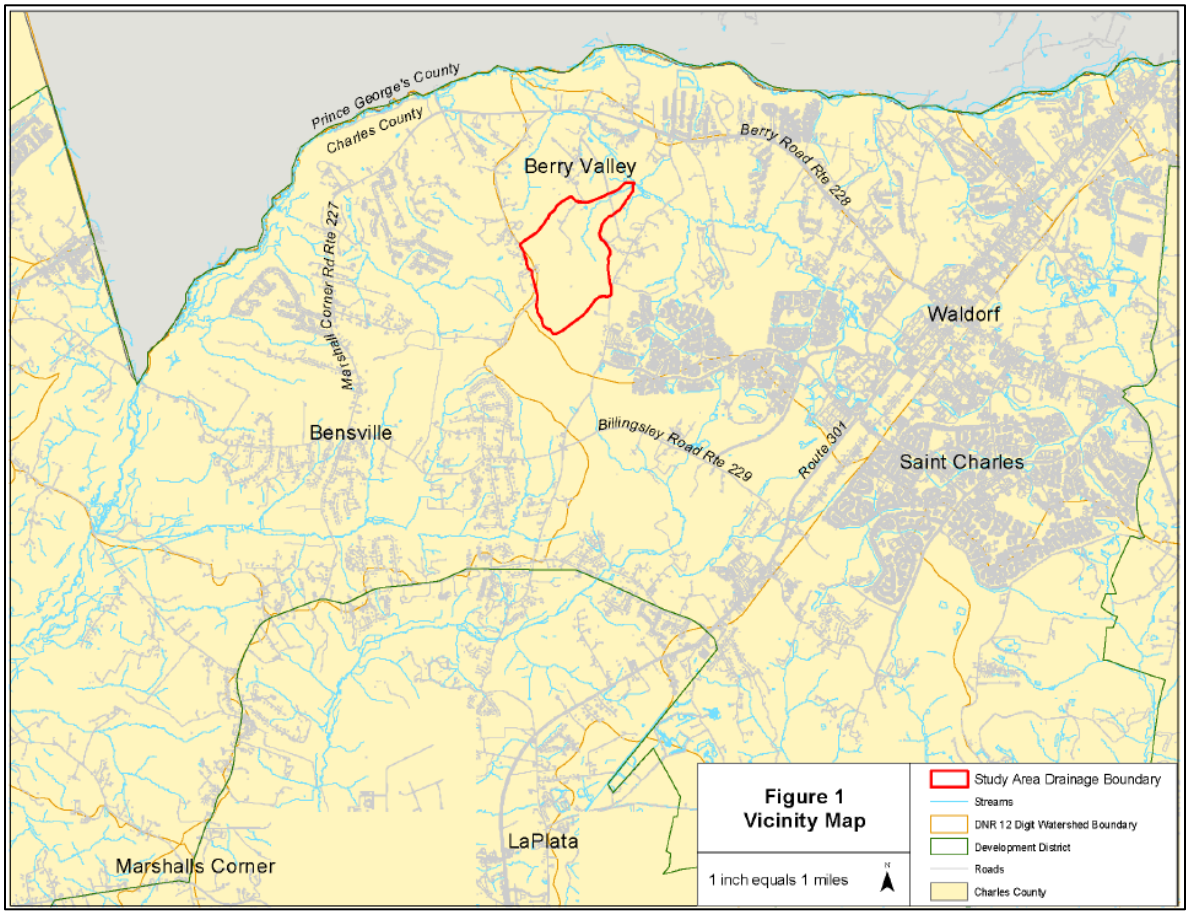
c. *A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.*

FY 2019 Status

Since 2003, the County has been conducting stream monitoring on the tributary to Piney Branch to evaluate the effectiveness of stormwater management, designed under the stormwater design regulations in the *2000 Maryland Stormwater Design Manual*, to adequately provide channel protection. The most recent assessment was conducted in April 2019. A map of the location is on the following page.

The tributary to Piney Branch study area lies between Berry Road and Middletown Road and is a part of watershed 021401110785. The drainage area was historically in agricultural and forest use. The study area is located within the County's Development District and has been under development since the start of monitoring in 2003 with the addition of North Point High School, William A. Diggs Elementary School and the residential developments of Windsor Mill, Avalon, and Middletown Woods.

In the fall of 2003, at the time of the first site visits and survey, the North Point site construction was well underway with full clearing and installation of temporary storm water management (SWM) facilities. By the spring of 2004 clearing and grading were complete at the Windsor Mill site and all four temporary SWM facilities were in place, three of which were in the study area. In the fall of 2004, the Windsor Mill site had roadways in place and the ponds had risers installed. Temporary SWM ponds were in place and functioning properly at the Avalon site. By the spring of 2005, little had changed at the Windsor Mill site, while homes were beginning to be built at the Avalon site. Construction of North Point High School was complete in 2005. By 2006, the William A. Diggs Elementary School was also complete. Site visits in late 2006 and early 2007 did not show major changes in the study area from the previous year. In 2008 and 2009 houses continued to be added to the western portion of the Avalon development. By 2013, more homes were added to Phase II of the Avalon community and many homes had been constructed south of Avalon Phase I. Just outside of the study area, construction continued at the Avalon West community with many new homes built since 2009. Additional homes were under construction on existing lots in the Avalon community in 2014. In early 2015, several new streets were under construction as part of Middletown Woods, located on the southern side of Frankfurt Drive within the drainage area. New home construction along those streets was nearing completion in 2017 and no new construction was observed between 2017 and 2018. The Maryland Department of Transportation's State Highway Administration (SHA) is proposing to plant approximately 22 acres of trees in the summer of 2018 within the drainage boundary. In 2019, trees were planted in subwatersheds 1 and 2 within Avalon development between Devonfield Ave. and Downshire Ct. The exact area of planting is not mapped but based on field observations approximately 10 acres of trees were planted. There was no other significant development or land use changes noted in the watershed.



Profiles 1 & 2

The assessment includes surveys of a longitudinal profiles (Profiles 1 and 2) of the stream thalweg and cross sections along each profile. The profile surveys are conducted to locate and quantify the length and sequence of various instream features such as riffles, pools and glides. The profiles surveyed in the fall of 2003 represent the pre-construction baseline conditions, as was conducted before stormwater runoff from upstream sites was generated. The surveys are repeated yearly and compared to previous assessments for changes in stream morphology such as thalweg degradation or aggradation. Visual inspection and site photographs are also compared for changes in stability, planform, dominant substrate particle sizes and signs of excessive sedimentation. Cross Sections 1, 2, 4, 5, and the Stream Gauge Cross Section are located on Profile 1, and Cross Section 3 is located on Profile 2.

Profile 1 - Station 0+00 to 26+35

Profile 1 between station 0+00 and the confluence with Profile 2 is in a confined stream valley

with relatively steep valley walls. The valley has a well-developed floodplain that varies from approximately 100 to 150 feet wide, with the channel meandering within the valley. Several beaver dams (both active and inactive) and their associated ponds, have been present throughout the years of monitoring. This portion of Profile 1 receives stormwater runoff from both Windsor Mill and Avalon. The majority of Avalon runoff flows into the segment with Profile 2 and then into Profile 1 at the confluence at station 25+25.

Cross Section 1
Cross Section 1 is located at station 5+13 with the channel adjacent to the valley wall. In the early years of monitoring the thalweg was generally shifting toward the right side of the channel (the outside of the meander) with aggradation along the left bank. The increase in aggradation may have been due to the increased beaver activity in the vicinity of Cross Section 1. At the 2014 survey, a beaver dam had been built through the cross section, significantly decreasing the cross sectional area and diverting some of the stream flow around the cross section. A second beaver dam had been built approximately 10 feet downstream of Cross Section 1 in 2015. Both of these dams remained in place through 2018. In 2019 the second beaver dam had washed out, but the beaver dam built through the cross section remained unchanged.

Cross Section 2
Cross Section 2 is located at station 15+66 on a generally stable reach with good floodplain connectivity. In general, the cross sectional area has been increasing slowly since the baseline survey due to downcutting of the channel and undercutting of the banks. By the fall of 2009, the cross sectional area increased by 40 percent larger than the baseline condition. Minor changes in the bed and banks occurred between 2014 and 2017. In 2018, the thalweg moved to the left side of the channel, though the cross section area remained nearly the same. In 2019 the channel continued to degrade on the left side and degraded slightly on the right side as well. As of 2019, the cross sectional area has increased by 42 percent over the baseline monitoring.

Stream Gauge Cross Section
A permanent stream gauge which was installed in May of 2004 at the Stream Gauge Cross Section was found vandalized in 2013 and no gauge data had been recorded since March 2010. The section is located at station 16+19 on Profile 1, just upstream of Cross Section 2. Similarly to Cross Section 2, the cross sectional area has been following an increasing trend since the baseline survey due to downcutting of the channel and undercutting of the banks. The trend continued until 2019, when the cross sectional area decreased due to bed aggradation. The cross sectional area was 55 percent larger in 2019 than at the initial survey.

Profile 1 - Station 26+35 to 45+00

Profile 1 extends between station 26+35 (near the confluence with Profile 2) and approximately

station 37+00 and is characterized by steep valley slopes to the southwest and little relief on the northeast terrace. The stream valley from station 37+00 to the upstream end of Profile 1 (approximately at station 45+00) is not confined and the topography levels out even further upstream of the profile where a forested wetland currently exists. This reach includes an MSHA ROW and areas cleared for the sewer line. In general, the water surface slope has decreased slightly since the initial survey in 2003, though it remained nearly the same for the past several years. In 2018, no active beaver dams were observed in this reach, but several relic dams remained. In 2019, a large new beaver dam was built in the MSHA ROW that prevented survey upstream of the ROW due to depth of backwater. This portion of Profile 1 receives flow from Windsor Mill and flow from the eastern half of Avalon.

Cross Section 4
Cross Section 4 is located at station 38+40, within the MSHA ROW property, but downstream of the utility ROW. This reach has been stable and surrounded by dense riparian vegetation in all survey years. The banks have remained relatively stable since the baseline monitoring, while there have been minor changes in the bed over the years. Overall, the cross section area has increased by 8 percent from 2003 to 2019. Cross Section 4 receives flow from two of the three Windsor Mill ponds.

Cross Section 5
Cross Section 5 is located at station 44+09, upstream of the ROW crossing. Aggradation in the thalweg and slight scour of the left bank has occurred since the baseline monitoring, but in general the cross sectional area has remained stable. The cross sectional area in 2018 was nearly the same as at the baseline monitoring. In 2019, a large new beaver dam located downstream of cross section 5 near station 41+60 caused significant backwatering extending upstream past the cross section. The left end pin of the cross section was buried in the remnants of another beaver dam that had been built at the cross section and washed out between the 2018 and 2019 surveys. The cross section was surveyed using an estimation of the location of the left end pin. The cross sectional area only decreased by 4% from 2018 to 2019 due to aggradation from the beaver dam, but the wetted width increased from 10.4 ft in 2018 to 26.9 ft in 2019, and the water depth increased from 0.79 ft to 3.49 ft. Cross Section 5 receives flow from the one most upstream pond in Windsor Mill.

Profile 2 - Station 0+00 to 4+50

The Profile 2 channel is in a valley with 100-foot wide floodplain. The area upstream of Profile 2 is a very densely vegetated forested wetland. No beaver dams were located on this reach, however debris blockages have typically been present. Profile 2 receives the majority of flow from the Avalon development, although it did not appear that any had been received prior to the 2005 survey. The reach also receives flow from William A. Diggs Elementary School.

Cross Section 3
Cross Section 3 is located at station 2+29 on Profile 2, approximately halfway up the surveyed

reach. This section had a large tree uproot on the right bank between 2010 and 2013, causing the cross sectional area to increase substantially. The cross section remained nearly the same from 2013 to 2017. In 2018, the point bar along the left bank had increased in size, decreasing the cross sectional area. IN 2019, the point bar continued to increase in size but the thalweg shifted further right under exposed tree roots, so the cross sectional area increased slightly. The cross sectional area has increased by 59 percent since the baseline monitoring.

Subwatershed Analysis

Subwatersheds (subsheds) were delineated within the study area watershed to analyze the changes in impervious area and land use that are potentially affecting the receiving channels and mainstem of the tributary. Impervious area in all of the subsheds has increased since 2004 due to the development throughout the headwaters of the watershed. The largest increase was observed in subsheds 1 and 2. Subshed 1 had 0.7% impervious in 2004 and approximately 23.7% in 2017 (no change between 2017 to 2019). Subshed 2 had no impervious surface in 2004, but had 20.9% impervious in 2014, and remained the same since then. Overall, the entire watershed drainage area, which is represented by subshed 4, saw a marked increase in imperviousness since 2004 jumping from 1.1% to 13.9% in 2017. Land use within the subsheds consists of forest, residential, and institutional. In 2016, residential land use continued to replace forest in subshed 1 with the addition of several streets in Middletown Woods, a development at the southwestern side of the Avalon community. With the completion of Middletown Woods in 2017, planned residential developments in the watershed are fully built.

North Point High School Pond Outfall

In 2011, KCI was directed to conduct a survey of an eroded outfall channel draining a stormwater management pond at the North Point High School within the tributary to Piney Branch watershed. Monuments were established and the initial survey was completed on April 26, 2011. Additional surveys were completed from 2013 to 2019.

Profile

The geomorphic survey begins at the pond outfall invert and extends just over 415 linear feet downstream. Riprap covers the channel and banks from the pond outlet to station 0+34. The trapezoidal engineered channel extends to approximately station 2+80 where the stream enters the forest and transitions to a natural channel. The channel profile from 0+00 to the end of the engineered channel has remained relatively unchanged from 2011 to 2019. The slope steepens significantly after the engineered channel ends, where a series of headcuts have formed and extend for approximately 40 feet. The initial headcut has continued to migrate upstream since monitoring began. Severe erosion before the 2018 monitoring caused the bed elevation to drop more than five feet over the initial headcut. In 2019 the headcuts began in approximately the same location (station 2+67), however the five-foot headcut had become undercut which caused the loss of about five feet of material in the upstream direction (station 2+92 to 2+87).

Downstream of the headcuts at station 3+20, the stream becomes more stable and less incised, and meets the main channel approximately 75 feet downstream from the end of the survey at station 4+15. A second headcut started to form in 2018 at station 4+05, and in 2019 the bed elevation dropped approximately 2 feet over this headcut. From the upstream end end of the headcuts to the end of the survey, the channel bed slope was 7.8% in 2011 and 6.7% in 2019. Four cross sections were surveyed at representative locations along the profile and rebar monuments were installed on both banks of each cross section.

Cross Section 1
Cross Section 1, station 0+11, characterizes the reach from the outfall to approximately station 0+40. This section has steep (45% side slopes), 12-foot high banks with riprap on the banks and channel bottom. Willows (*Salix* sp.) were dense in the channel each year until 2016, when it was observed that all vegetation was removed from the outfall to approximately station 0+80. This segment of the channel is very stable. Backwatered conditions due to root masses downstream have existed at this cross section in most years, including 2019. Excessive fine deposition (silt) was observed in this portion of the reach in 2017 to 2019.

Cross Section 2
Cross Section 2, station 1+18, characterizes the reach from station 0+40 to approximately 2+00. This section has dense willows in the channel, but the banks are slightly less steep (35% side slopes) than at Cross Section 1, with shallower 9-foot banks. This segment of the channel is also very stable and typically backwatered by root masses.

Cross Section 3
Cross Section 3, station 2+36, characterizes the reach from station 2+00 to the end of the engineered channel where headcuts begin approximately at station 2+67. The headcuts have migrated upstream since 2014 when they were at station 2+80. Willows are much less dense in this section, allowing cattails to be the dominant vegetation. Both banks are much lower (3.5 feet) and had a more gradual slope (22% side slope) than the two upstream cross sections. This cross section is also very stable. Deposition of fine sediment has formed an inset floodplain for the narrow (approximately one foot wide) low-flow channel that was observed starting in 2014. As no erosion of the bed or banks was noted upstream of Cross Section 3, the sediment being deposited here may be from the pond, which could indicate the pond is not functioning (not retaining sediment). No major changes were noted in 2019.

Cross Section 4
Cross Section 4, located at station 3+73, characterizes the reach from station 2+80 to the end of the survey at 4+15. This section begins at the edge of a canopied forest below the engineered channel and then transitions into a low gradient wetland. In 2011, a 1.5 foot headcut with moderately severe bank erosion was located just upstream of Cross Section 4. The headcut had migrated upstream approximately 50 feet by 2013. Due to the changes created by the headcut upstream, this cross section was initially much less stable than the others but has had stable

banks and bed through 2017. In 2018, the cross section was deeper due to the formation of a pool at a debris jam just downstream. The left bank had also experienced some erosion. In 2019 the bed elevation at Cross Section 4 had aggraded significantly, and the left bank had continued to erode. Overall the cross sectional area has increased by 56 percent since the baseline monitoring.

Summary

The tributary to Piney Branch channel cross sections and profiles indicate a relatively stable channel, with minor changes at most cross sections between 2018 and 2019. The greatest change in cross sectional area since the baseline survey in 2003 was noted at Cross Section 1, where a beaver dam built was directly through the cross section between the 2013 and 2014 surveys, resulting in a 95% decrease in area. This dam remained through 2019. The area at Cross Section 3 has also changed considerably since the baseline survey. This is in association with the tree on the right bank that became uprooted between 2009 and 2013, increasing the cross sectional area. Despite these changes, the reaches associated with these cross sections do not show evidence of larger scale incision or widening.

Downstream of Cross Section 1, however, all beaver dams and remnant dams had been washed out in 2018, likely as a result of the significant storm on February 10-11th, 2018. While evidence of flows having accessed the floodplain were noted throughout the study area in 2018 and 2019, major changes were noted downstream of Cross Section 1 in 2018. A large headcut was present near station 4+00 and the channel had downcut through areas that were previously backwatered by beaver dams, leaving an incised single-threaded channel with bank erosion present in places. In 2019 the headcut seemed to have stabilized and no other major changes were noted, but the channel will likely continue to change in response to the new stream flow regime unless the beaver dams are rebuilt.

Although the cross sectional area of Cross Section 2 remained nearly the same as in 2017 to 2018, the thalweg deepened along the left bank while a point bar formed along the right bank. The thalweg continued to deepen along the left bank in 2019, while the point bar on the left bank degraded slightly. Since the baseline monitoring, area at this cross section has increased

by 42 percent (though little change occurred between 2015 and 2019). The Stream Gauge Cross Section, located approximately 50 feet upstream of Cross Section 2, also showed downcutting of the thalweg, and slight widening from 2017 to 2018, then slight aggradation and narrowing from 2018 to 2019. The area of this cross section decreased by 11 percent since 2018 and increased 55 percent since 2003. Cross Section 2 and the Stream Gauge Cross Section, are located on Profile 1 downstream from the confluence with Profile 2, receiving drainage from the William A. Diggs Elementary School and Avalon and Windsor Mill developments. These sections are located on a relatively confined section of channel, the most likely position in the watershed for incision to occur. The steady increases in cross sectional area over time indicate that this area is responding to hydrologic changes by increasing the size of the channel. However, the stream in this reach still has access to its floodplain, as evidenced by sand deposition on the floodplain and debris racks at trees.

Cross Section 4 is located upstream of the confluence with Profile 2, and receives flow from two Windsor Mill stormwater ponds (Ponds 5 and 6). Cross sectional area of cross section 4 has changed little since 2003. The cross sectional area increased by just 8% from 2003 to 2019.

Cross Section 5 is the most upstream cross section which receives flow from one Windsor Mill stormwater pond. Cross Section 5 was influenced by beaver activity early in the monitoring, however the cross sectional area has remained consistent from 2003 to 2018. In 2019, a large beaver dam downstream of Cross Section 5 caused backwatering upstream far past Cross Section 5. A second beaver dam was built within the cross section after the 2018 survey and may have also caused downcutting of the thalweg as it constricted flows before being blown out prior to the 2019 survey. The remnants of this dam burined the left end pin of the cross section. The cross sectional area decreased by 5 percent since 2003. Though the cross sectional area did not change significantly, backwatering caused the water depth to rise from 0.79 ft to 3.49 ft.

The upper portion of the North Point High School pond outfall channel remains very stable, but the middle of the profile continues to degrade with severe headcutting. In 2011, a 1.5 foot headcut had formed at station 3+68. Just two years later, the headcut had migrated 51 feet upstream. In 2018, the headcuts began at station 2+67 with a 5 foot drop. In 2019, the start of the headcut remained at station 2+67, but the main drop had become undercut by about 5 feet (station 2+92 to 2+87) and the drop

increased to 5.5 feet. Cross Sections 1 and 2 remain stable and no changes were noted. Cross Section 3 continues to have a small channel inset in a floodplain made up of fine sediment deposition, which was first noted in 2013. The source of the silt appears to be the stormwater pond, as there is no erosion in the outfall channel upstream of this cross section. The continued release of fine sediments from the pond may indicate that it is not functioning correctly, and therefore an evaluation is recommended.

Cross Section 4 is located below the series of headcuts and experienced severe bank erosion and some downcutting between the initial survey in 2011 and the second survey in 2013. The cross section has changed little between 2014 and 2017. In 2018, the cross section was deeper due to the formation of a pool at a debris jam just downstream, and the left bank had experienced some erosion.

As stated in 2014, it is still recommended that remedial action is taken to stabilize the headcuts in the outfall channel. A considerable amount of sediment is being eroded from the channel and transferred into downstream waters. Due to the sudden slope change at the end of the engineered channel and start of the natural channel, the headcut will likely continue to migrate upstream, further degrading the channel and causing sedimentation downstream. In 2019, the cross section was much shallower due to aggradation, and the left bank continued to erode.

As stated in the 2014 report, it is still recommended that remedial action is taken to stabilize the headcuts in the outfall channel. A considerable amount of sediment is being eroded from the channel and transferred into downstream waters. Due to the sudden slope change at the end of the engineered channel and start of the natural channel, the headcut will likely continue to migrate upstream, further degrading the channel and causing sedimentation downstream.

A riprap stabilized outfall channel, from what appears to be a stormwater management facility in the SHA ROW is degrading and releasing a considerable amount of sediment to the Tributary to Piney Branch. The channel conveys flows down the valley wall and ends on the right floodplain (facing downstream) of the tributary near the largest beaver dam, at station 6+50. Sand and gravel eroded from the channel and deposited on the floodplain can be seen in photos in Appendix G.

A large new beaver dam was constructed between the 2018 and 2019 surveys within the upstream portion of the reach (station 41+61). This beaver dam has resulted in a backwater pool which has flooded the sewer crossing and extends from the dam across the sewer line ROW upstream past the extent of the surveyed reach. It is recommended that the safety of backwatering the sewer line be evaluated and the dam possibly be removed.

Imperviousness in the drainage area has increased from 1.1% in 2004 to 13.9% in 2017 (no change in 2018 or 2019). Development in the drainage area appears to have slowed with the completion of the Middletown Woods development, but is expected to pick up again with the building of Windsor Mill 2 which includes an additional 50 single family homes.

Any impacts resulting from the increasing imperviousness and land use change from forest to residential may be seen years after the development is finished. The beaver dams in the downstream end of Profile 1 are retaining sediment and preventing degradation of the channel. Despite this, Cross Section 2 and the Stream Gauge Cross Section, located just upstream of the beaver ponds, have experienced both downcutting and widening since the baseline survey.

In other areas however, the stream has more frequent floodplain access as well as extensive floodplain wetlands upstream of these cross sections. Cross Sections 4 and 5 have experienced little change over the monitoring period. The remaining forested wetlands in the headwaters of Profiles 1 and 2 may also be contributing to channel protection. The planned SHA tree planting may also have a positive effect on the area in the future.

The full 2018 report, *Maryland Stormwater Manual Channel Protection Criteria Effectiveness Study, Stream Monitoring at the Tributary to Piney Branch*, is included in Appendix G.

III.G. Program Funding

Overview of Permit Conditions

1. *Annually, Charles County shall submit a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit.*
2. *Charles County shall maintain adequate program funding to comply with all conditions of this permit.*

FY 2019 Status

Funding Sources

Since the County's first generation NPDES MS4 permit was issued in 1997, the County has had dedicated enterprise funding to ensure permit compliance. The two original enterprise funds include the Environmental Service Fund, and the Inspection and Review Fund. Later in 2013, the Watershed Protection and Restoration Fund was adopted. Revenues to support the enterprise funds are from the Environmental Service Fee, Lot Recordation Fee, Inspection and Review Fees, Stormwater Remediation Fee, and most recently a small subsidy from the General Fund's Transfer Tax revenues. The adopted FY 2020 Enterprise Funds are in Appendix H. Following is the historical account of the enterprise funds and their revenues sources.

1. Environmental Service Fund (ESF): In July 1997, the County implemented a $2.00 increase to its existing annual ESF fee for all improved properties county-wide, including those in the towns, and allocated the increase to the NPDES MS4 permit budget. The table below shows the rate of this allocation from 1998 thru 2013, at which time the Watershed Protection and Restoration Fund (WPRF) became the NPDES MS4 permit's primary budget source. However, a portion of the ESF continues to be allocated for litter control outreach, and septic programs.

Fiscal Year	1998-2007	2008	2009	2010	2011	2012	2013
ESF NPDES MS4 Allocated Fee	$2	$4	$5	$6	$8	$12	$14

Also in July 1997 the County implemented an NPDES lot recordation fee of $81.25 per lot, for all new lots recorded in the Development District. Rates are shown in the following table for 1998 thru 2013, at which time the fee was deposited into the WPRF.

Fiscal Year	1998-2000	2001-2004	2005-2008	2009-2012	2013
Lot Recordation Fee	$81.25	$84.50	$87	$117	$121

2. Inspection and Review Fund: To meet the NPDES MS4 permit conditions which require the County to maintain acceptable stormwater management and erosion and sediment control programs for new development in accordance with the Annotated Code of Maryland, the County maintains an Inspection and Review Fund. Operating revenues for this fund are generated primarily by service charges for engineering plan reviews, site plan reviews, grading inspection, erosion and sediment control inspections, storm drain and stormwater inspections. Fees have been adjusted over time to cover the cost of providing these services. Funding from this account is for salary and fringe of full time and contractual positions.

Fiscal Year	2020
Review Fees	
SWM for Single Family Res. Building Permits	$54
Nonstructural Stormwater Management Practice	$15/credit
Concept Stormwater Management Review Fee	$142/hour, $140 Min.
Site Stormwater Management Review Fee (Minimum, plus hourly rate)	$142/hour, $515 Min.
Stormwater Drainage Plan Review based on Construction Value	Up to $4,000
Stormwater Management Plan Review based on Construction Value	Up to $6,415
Revisions to Approved Stormwater Management Plans	$157/hour
Waiver Fees	
Stormwater Management Administrative Waiver Fee	$419
Stormwater Management Waiver Review Fee	$505 + $102 per study point over 2
Stormwater Management Fee-In-Lieu-Of	$1.35/sq.ft. disturbed
Inspection Fees	
Stormwater Management Inspection for Building Permits	$177
Stormwater Drainage Inspection	4.77% of Construction $444 Min.
Stormwater Management Inspection	4.77% of Construction $444 Min.
Erosion and Sediment Control	
Erosion and Sediment for New Single Family Residential Permit	$52
Erosion and Sediment Control Plan	$42 + $104/acre for disturbance, plus fee for number of houses
Erosion and Sediment Control Inspection Fee (3 Inspections per residential or forest harvest permit)	$185
Erosion and Sediment Control Reinspection Fee (per each reinspection for residential or forest harvest permit)	$62
Erosion and Sediment Control Inspection Fee	$537/acre, $532 Min.

*More information can be found on the Charles County Government All FY20 Fees & Charges table.

3. Watershed Protection and Restoration Fund (WPRF): In June 2013, Charles County adopted Chapter 275 of the Charles County Code, establishing the Watershed Protection and Restoration Program and associated Stormwater Remediation Fee. The WPRF may be used for: capital improvements for stormwater management, including stream and wetland restoration projects; operation and maintenance of stormwater management systems and facilities; public education and outreach related stormwater management or stream and wetland restoration; stormwater management planning, including mapping and assessment of impervious surfaces, as well as related monitoring, inspection, and enforcement activities; reasonable costs necessary to administer to fund; and grants to nonprofit organizations for watershed restoration projects. A full discussion of the adoption process and legislation is included in the 2013 NPDES MS4 Annual Report.

The Stormwater Remediation Fee is a flat rate charged to all improved properties countywide, except in the Town of La Plata which assesses their own fees, and otherwise exempt properties. Property owners may obtain a 50% fee credit by demonstrating the use of onsite stormwater practices such as rain gardens, pervious paving and other options. The following table shows the rate since adoption. Credits and exemptions are reported annually.

Fiscal Year	2014	2015	2016	2017	2018	2019	2020
Stormwater Remediation Fee	$43	$43	$35	$39	$54	$61	$78

The third generation NPDES MS4 permit coverage was expanded countywide, however the lot recordation fee continues to apply only to new lots recorded in the Development District because this continues to be the County's urban area.

Fiscal Year	2014	2015	2016	2017	2018	2019	2020
Lot Recordation Fee	$121	$127	$131	$138	$142	$146	$154

Since FY 2016, subsidies from the General Fund have been approved in order to maintain a stable fee. In Fiscal Years 2016 and 2017, the full subsidy, shown below, was not necessary. In FY 2018, none of the subsidy was needed. In FY 2019, all of the subsidy was needed.

Fiscal Year	2016	2017	2018	2019	2020
General Fund Transfer	$550,000	$550,000	$550,000	$550,000	$550,000

NPDES MS4 Permit Funding for Fiscal Years 2007 through 2013

The table below contains revenue and expenses of the NPDES MS4 permit program for Fiscal Years 2007 thru 2013 to primarily support the County Department of Planning and Growth Management. An account of years prior to 2007 can be found in previous NPDES MS4 annual reports.

ESF NPDES MS4 Permit Funding - Fiscal Years 2007 through 2013

Fiscal Year	2007	2008	2009	2010	2011	2012	2013
Adopted Budget:	163,800	263,600	305,400	361,500	458,300	698,400	998,200
Revenue:							
Env. Service Fee	88,989	181,787	230,212	278,528	375,789	613,290	727,671
Lot Recordation Fee	84,748	54,246	33,705	35,928	80,847	83,187	76,956
Total	173,738	236,033	263,917	314,456	456,636	696,477	804,627
Expenditures:							
Salary & Fringe	0	0	0	0*	49,560	102,358	267,352
Operating	149,906	109,246	184,198	180,315	167,183	143,604	291,817
Debt Service	25,666	109,463	120,633	182,855	217,865	262,258	327,851
Adjustment						(109)	
Total	175,571	218,709	304,831	363,170	434,608	508,112	887,019
Operating Inc/Loss	(1,834)	17,324	(40,914)	(48,714)	22,028	188,366	(82,393)
Fund Balance:							
Beginning	155,765	153,932	171,255	130,341	205,752	227,781	416,146
Ending	153,932	171,255	130,341	81,627	227,781	416,146	333,754

*Salary & Fringe from general ESF.

Consultant expenses from the operating budget include KCI Technologies, Inc.(NPDES consultant), LimnoTech (Watershed Implementation Plan consultant), AquaLaw (legal consultant), Spatial Systems Associates, Inc. (GIS consultant), and the County's partnership agreement with U.S. Geological Survey (USGS) to perform water quality monitoring of the Mattawoman Creek.

ESF NPDES MS4 Permit Positions – Fiscal Years 2010 through 2013

Department-Division	Position	2010	2011	2012	2013
PGM- CPIS	Engineer I-IV	0	0	0	1.00
PGM- CPIS	Administrative I-III	0	0	0	0.30
PGM- Planning	Planner I-III	0.50	0.50	0.50	0.80
PGM-RIM	Resource Manager	0	0	0.50	0.50

NPDES MS4 Permit Funding for Fiscal Years 2014 through 2020

As mentioned above, beginning in FY 2014, the NPDES MS4 permit is primarily funded by the WPRF. The WPRF supports applicable expenditures from County Departments including: Planning and Growth Management, Public Works, County Attorney's Office, and Fiscal and Administrative Services. The following tables summarizes the WPRF budget to date, and funded staff positions.

Table 26: WPRF NPDES MS4 Permit Funding - Fiscal Years 2014 through 2020

Fiscal Year	2014 Audited	2015 Audited	2016 Audited	2017 Audited	2018 Unaudited	2019 Unaudited	2020 Budget
Budget:	2,133,000	2,168,800	2,475,700	2,685,600	3,610,900	4,448,470	4,764,700
Revenue:							
Stormwater Remediation Fee	2,097,368	2,124,017	1,751,566	1,981,534	2,831,120	3,080,369	4,039,800
Recordation Fee per Lot	53,272	61,323	55,659	50,094	72,700	39,566	50,700
Miscellaneous	7,282	7,186	6,510	6,802	8,557	8,941	7,200
General Fund Subsidy	0	0	386,579	236,579	0	550,000	550,000
Total Operating Revenues	2,158,061	2,192,526	2,200,314	2,275,009	2,912,377	4,401,889	4,647,700
Expenditures:							
Salary & Fringe	186,641	309,630	305,735	315,722	368,520	563,614	811,200
Operating	690,947	924,665	1,167,914	1,106,138	1,454,608	1,607,530	1,944,200
Capital Project Transfer	182,000	60,000	35,000	112,000	120,000	708,380	67,000
Debt Service	531,067	568,957	740,331	895,379	1,105,281	1,365,884	1,942,300
Total Expenditures	1,588,654	1,863,252	2,248,980	2,429,238	3,048,409	4,245,408	4,764,700
Operating Gain/(Loss)	567,406	329,274	(48,666)	(154,230)	(136,032)	(566,532)	(117,000)
Fund Balance:							
Beginning	0	902,890	1,232,164	1,183,498	1,029,268	893,236	326,704
Reserve carryover from ESF Fund	335,484	0	0	0	0	0	0
Ending	902,890	1,232,164	1,183,498	1,029,097	893,236	326,704	209,704

Table 27: WPRF NPDES MS4 Permit Positions - Fiscal Years 2014 through 2020

Dept.-Division	Position	2014	2015	2016	2017	2018	2019	2020
PGM-Admin	Director	-	-	-	-	0.1	0.1	0.1
PGM-Admin	Deputy Director	-	-	-	-	0.1	0.1	0.1
PGM-Admin	Assist to the Director	-	-	-	-	0.1	0.1	0.1
PGM-CPIS	Chief	-	-	-	-	0.1	0.1	0.1
PGM-CPIS	Dev Services Manager	-	-	0.1	0.1	-	-	-
PGM-CPIS-Permits	Engineer I-IV	0.5	0.5	0.5	0.4	0.4	0.8	1.8
PGM-CPIS-Permits	Floodplain Mgmt. Eng.	-	-	-	0.1	0.1	0.0	0.0
PGM-CPIS-Insp	Engineer IV	-	-	-	-	0.1	0.1	0.1
PGM-CPIS-Insp	Permit Technician	-	-	-	-	0.3	0.3	0.3
PGM-CPIS-Insp	Inspector	-	-	-	-	-	-	2.0
PGM-Planning	Chief	-	-	-	-	0.3	0.3	0.3
PGM-Planning	Assistant Chief	-	-	-	-	0.1	0.1	0.1
PGM-Planning	Assist to the Chief	-	-	-	-	0.1	0.1	0.1
PGM-Planning	Engineer I-IV	-	-	-	-	-	-	1.0
PGM-Planning	Planner IV	-	0.3	0.3	0.3	0.3	0.3	0.3
PGM-Planning	Planner I-III	1.8	1.8	1.8	1.8	2.0	2.0	2.0
PGM-Planning	Resource Analyst - GIS	-	-	-	-	0.1	0.1	0.1
PGM-RIM	Resource Analyst - GIS	-	-	-	-	0.1	-	-
DPW-Env Res	Env Compl. Officer	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DPW-Roads	Bridge Mgmt/Proj Mgr	-	-	-	-	0.1	1.0	1.0
TOTAL Full Time Equivalent (FTE)		3.3	3.6	3.7	3.7	5.3	6.5	10.5

A small percentage of the Environmental Service Fund is allocated to support the County's Septic Pump-Out Reimbursement Program implemented by the Department of Planning and Growth Management. This is because, a septic pumping is considered an alternative urban best management practice in MDE's 2014, *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for NPDES Permits*, and awarded 0.03 acres/septic pumped towards the impervious surface restoration goal. The County's program reimburses up to $187.50 per septic pump-out, which at the maximum rate would be $6,250/acre restored. A summary of the program is included in Appendix I of the 2017 NPDES MS4 Annual Report.

On October 16, 2018, the Charles County Commissioners adopted Bill No. 2018-08, which requires new home construction to install visible septic tank risers on each compartment of the septic tank for single-family dwellings that utilize on-site sewage disposal systems. Additionally, the Bill provides a reimbursement up to $100 per single-family dwelling for homeowners voluntarily choosing to have a septic tank riser installed, while sufficient funding is available. The County began implementation of the reimbursement program on December 1, 2018. The Septic Tank Risers program is in Chapter 122, Article I of the Charles County Code.

Table 28: ESF Budget for Septic Pump-Out Program – Fiscal Years 2014 through 2020

Fiscal Year	2014 Actual	2015 Actual	2016 Actual	2017 Audited	2018 Audited	2019 Budget	2020 Budget
Septic Pump-Out Reimbursement Budget	100,000	100,000	100,000	100,000	100,000	$108,000	100,000
Expenditures	2,895*	98,755	90,130	82,261	$91,822	$107,980	100,000

*Funding was used for research & discovery in establishing baseline knowledge of septic maintenance within the County.

A portion of the Environmental Service Fund is allocated to support the County's Education and Outreach Program to reduce litter entering the environment, which became a condition of the current MS4 permit, under Part IV.D.4. The litter control and recycling outreach efforts increase recycling and educate the public on the importance of reducing, reusing, and recycling.

Table 29: ESF Budget for DPW's Education & Outreach – Fiscal Years 2014 through 2020

Fiscal Year	2014 Actual	2015 Actual	2016 Audited	2017 Audited	2018 Audited	2019 Unaudited	2020 Budget
Education and Outreach Budget	198,300	159,000	173,700	187,700	214,200	229,740	227,000
Education and Outreach Expenditures	157,644	162,254	169,293	204,252	209,510	233,338	227,000

Table 30: ESF Positions Dedicated towards Education and Outreach - Fiscal Years 2014 thru 2020

Department-Division	Position	2014	2015	2016	2017	2018	2019	2020
DPW- Env Resources	Recyc./Litter Control Superintendent	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DPW- Env Resources	Recycling Manager	0.25	0.25	0.25	0.25	0.25	0.25	0.25
DPW- Env Resources	Recycling Supervisor	0.25	0.25	0.25	0.25	0.25	0.25	0.25
DPW- Env Resources	Recycling Supervisor	0.00	0.00	0.00	0.25	0.25	0.25	0.25

Capital Improvement Projects Budgets

Compliance with the Watershed Restoration condition of the NPDES MS4 permit is primarily through the County's Capital Improvements Program (CIP) budget. The CIP budget is funded by 30-year bonds. Payments on the bonds come from the ESF and WPRF, and are noted as 'Debt Service' on those tables above.

CIP funding was originally approved to begin in FY 2003 at the rate of $200,000 per year for a five-year period totaling $1 million, which was to cover permit retrofit requirements of the County's first NPDES MS4 permit. Shortly after this approval, the County was issued a second generation NPDES MS4 permit which increased the retrofit requirements and identified the requirements as 'Watershed Restoration.' In November 2004 the County Commissioners reviewed and supported the Charles County Watershed Restoration Study and the projects needed to meet the second generation permit conditions. Subsequently, the County Commissioners increased the Fiscal Years 2006 - 2011 CIP budget to $7.69 million, and the Fiscal Years 2010 – 2014 budget to $12.04 million to implement the proposed projects.

In February 2004 the County began issuing bonds for the NPDES Retrofits Projects (CIP) budget. In March 2007 construction was initiated on the County's first watershed restoration projects, which is reflected by the increased expenditures shown in the Table 36. Individual project budgets and expenditures are listed in Table 37 below.

Table 31: NPDES MS4 Capital Improvements Bond Expenditures through Fiscal Year 2019

Bonds Issued to Date	Issued	Spent	Balance
2004 Public Improvement Bond	40,000	40,000	0
2006 Public Improvement Bond	100,000	100,000	0
2007 Public Improvement Bond	1,000,000	1,000,000	0
2008 Public Improvement Bond	400,000	400,000	0
2009 Public Improvement Bond	471,800	471,800	0
2010 Public Improvement Bond	500,000	500,000	0
2011 Public Improvement Bond	1,400,000	1,400,000	0
2012 Public Improvement Bond	700,000	700,000	0
2013 Public Improvement Bond	1,700,000	1,700,000	0
2014 Public Improvement Bond	3,000,000	3,000,000	0
2015 Public Improvement Bond	2,000,000	1,968,097	31,903
2016 Public Improvement Bond	4,880,000	4,834,672	45,328
2017 Public Improvement Bond	4,800,000	4,685,978	114,022
2018 Public Improvement Bond	5,000,000	4,064,780	935,220
TOTAL	25,991,800	24,865,327	1,126,473

Table 32: Capital Improvement Expenditures through Fiscal Year 2019 for NPDES MS4 Projects

CIP for NPDES Retrofits	Budget	Spent	Balance
Carrington (8014)	1,867,230	1,867,219	complete
Pinefield (8023)	1,096,090	1,096,090	0
Acton/Hamilton (8024)	1,777,060	1,465,912	311,148
Bryan's Road (8025)	1,915,880	1,912,855	complete
NPDES Study (8028)	24,740	24,738	complete
Fox Run (8030)	930,670	930,632	complete
Lancaster (8031)	73,010	72,997	complete

CIP for NPDES Retrofits (Cont.)	Budget	Spent	Balance
Northwood (8032)	28,830	28,830	complete
Ryon Woods (8033)	121,750	121,716	complete
White Plains Retrofits (8034)	721,250	462,438	258,812
NPDES Mapping (8035)	716,110	716,103	7
GIS Mapping (8036)	455,530	455,521	complete
Pinefield Temi Drive (8037)	1,126,320	1,126,283	37
Holly Tree Lane Stream Restoration (8038)	1,632,490	1,632,468	22
Stavors Road (8039)	0	0	complete
Acton Lane (8040)	282,700	282,676	complete
Cobb Island Drainage Study (8043)	20,710	20,704	complete
Potomac Heights (8046)	839,550	729,612	109,938
Master Drainage Plan (8047)	182,000	149,500	32,500
Feasibility & Concept Design (8048)	1,965,880	1,917,597	48,283
Port Tobacco (8049)	11,750	11,744	6
Tanglewood (8050)	1,405,610	1,336,582	69,028
Charles County Plaza (8051)	1,070,700	833,654	237,046
Tenth District (8052)	97,250	97,239	complete
Swan Point WWTP Shoreline Stabilization (8053)	1,668,500	1,396,276	272,224
Public Works Campus Stormwater Management Improvements (8055)	1,412,000	963,380	448,620
General Smallwood Middle School (8056)	504,900	127,371	377,529
Lackey High School (8057)	122,700	112,213	10,487
Poplar Court - Laurel Branch (8058)	112,750	112,881	complete
TC Martin Elementary School (8059)	51,360	51,360	complete
JP Ryon Elementary School (8060)	41,360	41,354	complete
Piccowaxen Middle School / Higdon Elementary School (8061)	67,810	67,798	complete
McDonough High School (8062)	49,410	49,393	complete
JC Parks Elementary School / Matthew Henson Middle School (8063)	99,600	82,569	17,031
Mattawoman Middle School / Berry Elementary School (8065)	22,180	22,165	complete
Apple Creek Court (8066)	816,760	116,294	700,466
Roof Top Disconnects Inspections (8071)	38,150	38,141	complete
Cliffton Shoreline Restoration (8072)	1,423,670	158,492	1,265,178
Benedict Shoreline Restoration (8073)	864,190	864,156	34
Friendship Farm Park (8074)	97,940	97,932	complete
GIS Mapping (8075)	42,400	42,244	156
La Plata High School (8076)	793,680	250,433	543,247

CIP for NPDES Retrofits (Cont.)	Budget	Spent	Balance
Hale Court (8077)	65,880	65,864	complete
Adams Farm Lake (Lambeth Lake) (8078)	4,530	4,520	complete
Huntington Lake (8079)	4,530	4,520	complete
Wakefield Lake (8080)	4,530	4,520	complete
Post Office Road Lake (8081)	4,530	4,520	complete
Upper Zekiah Ponds (8082)	11,930	11,923	complete
Pinefield Drainage (8083)	1,643,000	1,130,719	512,281
St. Charles Parkway Stream Restoration (8084)	184,900	178,307	6,593
Bridle Path Stream Restoration (8085)	205,900	199,832	6,068
Ruth Swann Stream Restoration (8086)	211,100	199,078	12,022
Thomas Higdon Stream Restoration (8087)	217,300	210,386	6,914
Marbella Subdivision Stream Restoration (8088)	215,850	171,208	44,642
Longmeade Outfall Protection (8089)	96,830	96,803	complete
Bensville Park (8090)	1,103,300	113,184	990,116
Cliffton Shoreline Restoration Phase II (8091)	1,616,710	181,892	1,434,818
Bryan's Road Storm Filter Maintenance (8096)	20,000	18,753	1,247
Ruth Swann Tributary Channel Stream Restoration (8097)	106,000	58,410	47,590
Warren J. Willett Subdivision (8098)	6,000	2,644	3,356
Potomac Heights Shoreline Stabilization (8099)	116,100	111,624	4,476
South Hampton Stormwater (8100)	315,670	237,640	78,030
Oak Ridge Park- Upper West Branch Stream Restoration (8101)	226,680	131,987	94,693
Oak Ridge Park- Lower West Branch Stream Restoration (8102)	135,060	77,545	57,515
Cedar Tree Pond Retrofit (8103)	87,630	55,369	32,261
Wilton Court Pond Retrofit (8104)	108,190	74,486	33,704
Milton Somers Middle School Pond Retrofit and Stream Restoration (8105)	228,620	178,156	50,464
CSM Tributaries Stream Restoration (8106)	224,890	157,296	67,594
Oak Ridge Park - Upper Eastern Branch Stream Restoration (8108)	183,840	86,423	97,417
Oak Ridge Park – Lower Eastern Branch Stream Restoration (8109)	170,160	98,207	71,953
NPDES- Best Buy Pond Retrofit (8110)	85,000	44,727	40,273
CSM Lot 5 Outfall Stream Restoration (8111)	72,000	66,043	5,957
NPDES- White Plains Golf Course Pond Retrofit and Stream Restoration (8112)	99,920	49,717	50,203
NPDES- Walter Mitchell Outfall Repair and Stream Restoration (8113)	213,000	108,465	104,535

CIP for NPDES Retrofits (Cont.)	Budget	Spent	Balance
NPDES- Locust Grove Farm (8115)	282,000	2,243	279,757
NPDES- Port Tobacco Upper Stream Restoration (8116)	206,000	57,537	148,463
NPDES- Port Tobacco Lower Stream Restoration (8117)	201,000	53,959	147,041
NPDES- Ruth B. Swann North Tributary Stream Restoration (8118)	203,500	109,804	93,696
NPDES- White Oak Pond Retrofit (8119)	96,870	298	96,572
TBD (8019)	34,507,940	18,485	34,489,206
TOTAL	**70,079,360**	**26,364,905**	**43,711,151**

The Capital Improvement Program appropriation for the NPDES Retrofit budget is the annual amount approved by the County Commissioners. The appropriations are cumulative towards the project total.

Table 33: Capital Improvement Program Appropriation per Fiscal Year

CIP Appropriation per Year	
FY03	214,000
FY04	220,000
FY05	224,000
FY06	72,000
FY07	778,000
FY08	1,452,000
FY09	2,127,000

CIP Appropriation per Year	
FY10	2,409,000
FY11	2,409,000
FY12	1,505,000
FY13	5,657,000
FY14	5,290,000
FY15	3,135,000
FY16	11,514,000

CIP Appropriation per Year	
FY17	11,672,000
FY18	11,070,000
FY19	11,346,000
FY20	11,017,000
FY21	TBD
FY22	TBD
FY23	TBD

Fiscal Analysis of Permit Conditions

The adopted FY 2020 Enterprise Funds, which support the following permit conditions are in Appendix H. Permit task implementation is supported by the enterprise funds listed above and includes staff salary, contractual costs, and other expenses. In summary, the cost for permit implementation in FY 2019 follows:

Table 34: NPDES MS4 Permit Expenses per Permit Condition

Permit Condition	FY 2016 Audited	FY 2017 Audited	FY 2018 Audited	FY 2019 Unaudited
Source Identification	$209,459	$242,397	$243,961	$269,354
Stormwater Management	471,502	432,195	485,383	404,197
Erosion and Sediment Control	253,513	252,250	259,988	161,792
Illicit Detection and Elimination	71,938	48,638	47,336	60,916
Trash Elimination Education and	177,094	209,941	216,621	217,165
Property Management	129,887	168,876	125,253	196,884
Inlet Cleaning	75,613	78,104	90,359	98,714
Street Sweeping	50,682	50,705	100,632	84,585
Road Maintenance - Other	192,724	168,821	510,789	620,575
Public Education	181,697	202,654	218,253	257,292
Watershed Assessment	118,570	118,092	45,508	45,611
Watershed Restoration Planning &	834,367	917,073	1,141,599	1,422,163
Chemical Monitoring Assessment	83,767	74,561	79,847	101,366
Biological Monitoring and	26,611	23,134	25,040	39,549
Physical Stream Assessment	11,328	10,957	11,499	21,411
Design Manual Monitoring	11,328	10,957	11,499	21,411
TMDL Assessments	39,302	48,924	49,169	54,084
Total Cost	$2,939,382	$3,058,078	$3,662,736	$4,077,069

Financial Assurance Plan (FAP) and Watershed Protection and Restoration Program (WPRP) Annual Report

In June 2016, Charles County submitted the first FAP and WPRP Annual Report to the Maryland Department of Environment to fulfill requirements specified in Maryland Article-Environment, Section 4-202.1. The plan and report give an overview of actions implemented by Charles County per this NPDES MS4 permit and demonstrated the County's budget for these activities from various funding sources. The Charles County Commissioners voted to approve the FAP and WPRP Annual Report Resolution Number 2016-18 on June 28, 2016.

The second FAP Report Resolution Number 2018-08, was approved by the Charles County Commissioners on June 5, 2018. On June 6, 2019 MDE sent a review letter of the FAP requesting a revised FAP be submitted by June 30, 2019 and the approved FAP with FY 2019 Annual Report.

On June 28, 2019 Charles County submitted an updated FAP to MDE for their review. MDE found the updates acceptable and the Charles County Commissioners were briefed on the matter September 10, 2019. The County Commissioners held a Public Hearing on October 8, 2019 and scheduled a work session for further discussion and adoption of the updated FAP on October 29, 2019. The approved updated FAP is included in Appendix I. The FY 2019 WPRP Annual Report, which does not require County Commissioners' approval, is included in Appendix J.